GAS

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AUG 11 1942

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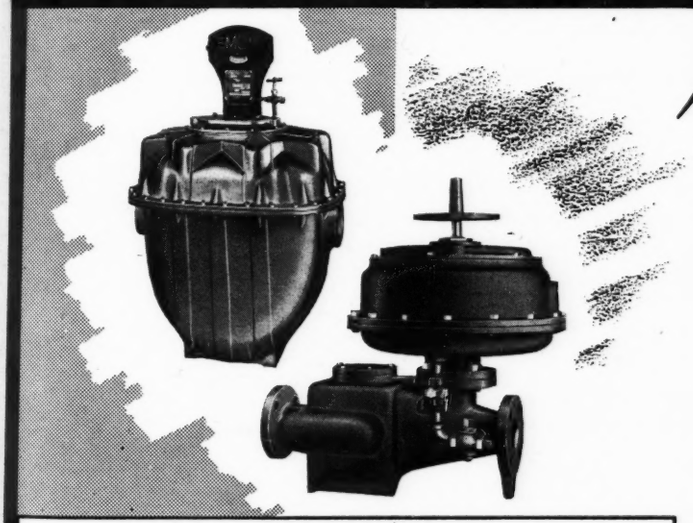

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Eighteenth Year of Publication

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GUEST EDITORIAL

DANGER SIGNALS

In Utility Regulation

By P. McDONALD BIDDISON
Consulting Engineer, Dallas, Texas

WHILE ordinary business, big and little, has given only very complacent attention, if any, to the struggles of utilities to prevent heavy property losses in regulatory procedure, they might now profitably take notice of the danger signals raised by recent developments in the field of utility regulation, for principles of property rights which develop into law through utility regulations and court decisions involved therein may well be stretched to cover all property.

In the light of the existing limitations of court review of commission acts, one of the findings in a recent order of the Federal Power Commission fixing the gate rates for a large natural gas pipe line company constitutes such a danger signal. The commission excluded from the rate base several millions of dollars of the original cost of the property solely because the amounts of the costs had been charged to operating expense. In so doing it ignored the facts that, at the time the costs were incurred, the company was not under regulation; that it was then customary accounting to so charge costs of that nature; that if the costs had been charged to plant account there would have been no question as to their inclusion in the rate base; that rates in the past were not affected in the slightest degree by the accounting practice because they were unregulated and determined, not by cost of service, but as in other unregulated businesses largely by the competitive fuel situation.

The order conveys the impression that the customers of that distant period acquired, by the payment of their gas bills, the ownership of any property whose cost was charged to operating expense and that such property is to be devoted without charge to the customers of today. At any rate, the utility is to be deprived of any earnings on such property and is to devote it to the service of its present customers without compensation for its use. Translated into terms of the corner grocery store, the purchase of six cans of tomatoes year before last by a lady, who has not been seen about the premises since, gives the patrons of today a vested interest in the present stock of goods because the grocer, following a simple system of accounting, charged the replenishment of his stock to operating expenses.

Protection against actions of departments, bureaus, and commissions which are arbitrary, unreasonable, or not supported by the facts shown is the primary function of a court review of their action. If the courts cease to function in this capacity, these findings and orders, no matter how arbitrary they may be, are final; and they need not conform to any statutory or constitutional provision for the safeguarding of any property.

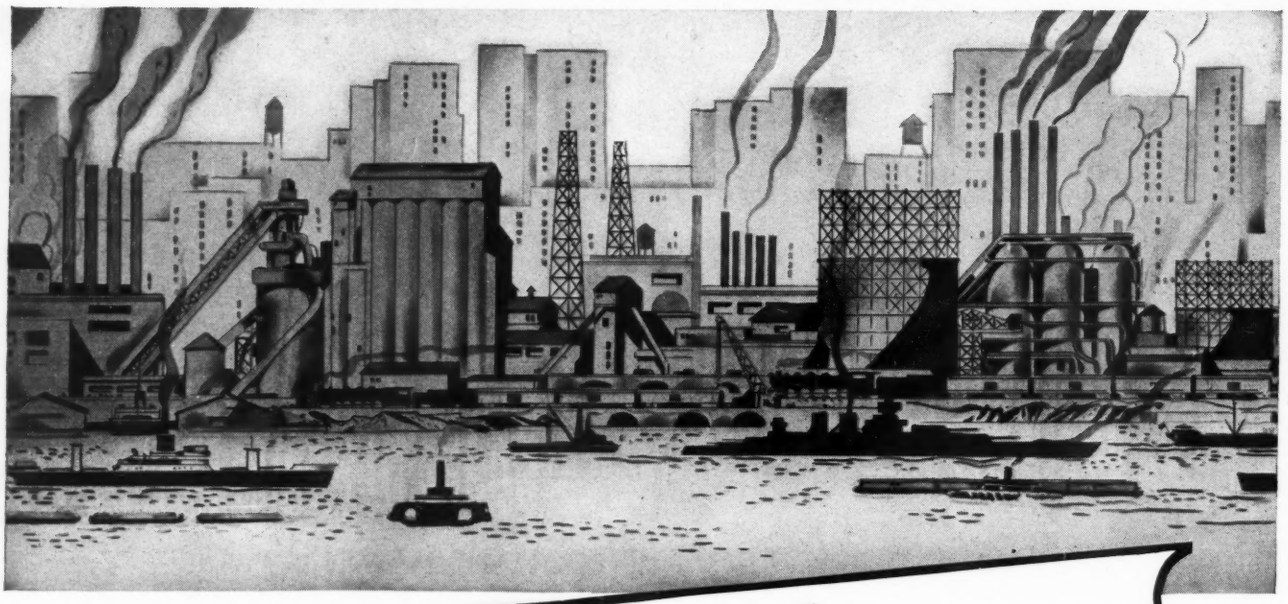
In the absence of specific statutory provision for court review, an aggrieved party must rely on the constitutional provisions for protection of property. As now interpreted, these provisions seem to embrace only a determination of whether or not the aggrieved party had been fully heard, which means that the findings will not be tested against the evidence. If there be no more effective control than this, then one who has lost his property or his rights, after having had a full hearing before a body which gave credence and weight only to that testimony adduced for and by them in behalf of the object they sought to attain, is indeed in a precarious situation. The Walters-Logan bill was an effort to provide by statute the protection once thought to be available by virtue of constitutional provisions, but which is being destroyed by court interpretation of the limits of review under the constitutional provisions.

Natural gas companies may have that statutory protection in the Natural Gas Act. Although three justices of the Supreme Court indicated, in a concurring opinion in the case of Natural Gas Pipeline Co. of America, that they thought the review, even under the Natural Gas Act, should be as limited as would meet the provisions of the Act, they did not go so far as to suggest that those provisions were placed in the Act simply on account of their merit as literature.

In a review under the Act, the court has "exclusive jurisdiction to affirm, modify, or set aside such order in whole or in part." The only restriction placed upon the court in this respect is that "the findings of the Commission as to the facts, if supported by substantial evidence, shall be conclusive."

The Act provides, furthermore, that the transcript of the proceedings is to be furnished to the court, that new and additional evidence may be presented and that the Commission may alter its findings of fact during the course of the review. These provisions indicate that the evidence is to be examined, otherwise there is little need of the transcript; that the findings of the Commission are not final but are to be tested; that a determination is to be made whether those findings are substantially supported by the evidence or substantially contradicted by the evidence; that the court is to determine whether the order is in conformity with the law and the facts; and finally, the court is to take appropriate action to "affirm, modify or set aside the order."

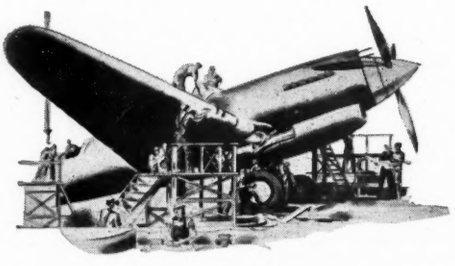
If the Natural Gas Act means what it seems to mean, then is it the turn of natural gas companies to give only complacent attention to the difficulties of other business, or is it the duty of all business to work for the protection of all business lest the protection now had by some be taken away in order to make all equal?



When the VICTORY STORY is written

WHEN THE VICTORY STORY is written the gas industry will have contributed a dramatic chapter. War-converted plants accellerate into armament output adequately provided with gas fuel and modern gas equipment. Cantonments and housing for war-workers and civilian services are supplied uninterruptedly. . . .

American Meter Company, along with other manufacturers in this vast service industry, is pledged to devote its capacity wholeheartedly to production for our armed forces. Meanwhile . . . still looking ahead . . . research goes on—striving toward greater post-war achievements.



AMERICAN METER COMPANY
INCORPORATED (ESTABLISHED 1836)

THERMALLY THINKING

Plan for Peace

WHILE the shouting and the tumult in industrial America today are all about the war effort, and every factor's participation in its requirements, there is not a business executive in the nation who is not assailed by the gnawing uncertainty of what the future holds in store for his industry, his enterprise, and himself.

It is easy enough to conjure up dire and violent scenarios on the theme of what would happen if we should lose the war, and the subject is having competent daily treatment at the hands of professionals. But the impression seems to have got about that there is something fundamentally selfish, almost subversive, about the business man or the business group that gives heed to the position that even patriotic zeal may lead to, once the inevitable armistice has been declared.

We would consider it little less than a cheap bid for reflected glory were we to harangue the gas industry on its patriotic obligation to the Nation at war. For to carry on such a campaign would be to imply that the industry needed from our editorial pen some prodding, some further clarification of the ethics and morality in which the roots of wartime patriotism lie.

Acting as a unit, the natural gas industry has done much the same as the normal average patriot has had to do. It has closed its eyes and its ears to much of the bungling that has accompanied our early attempts to get rapidly and completely into a war economy; it has given credit for good intentions to the many and often flagrant examples of political self-seeking that have highlighted the activities of individuals in administrative and directive positions. And where its service has been required it has delivered that service without reluctance, and in a measure unprecedented in all of its long and honorable history.

The picture today is one of expansion, with the industrial load requiring an always increasing percentage of the capacity of transmission and distribution facilities. Yet the domestic load, for cooking, house heating, water heating and, in recent years, refrigeration, has always been the backbone of the gas utility business. Those interested in the forward progress of gas cannot alter the fact that the residential market must for the duration of the war lie dormant. The story of the critical uses to which the iron, steel, copper, and brass that might otherwise go into appliances must be put in the interests of a speedy and decisive victory cannot be questioned, nor the desirability of its end doubted.

Yet it is entirely within the pervue of 1942 considerations to plan for the methods that will have to be employed to maintain and to continue to expand the domestic appliance markets of 1944 or of whatever year such expansion again becomes possible.

In the heating field coal is having its innings today, and the coal industry is making every effort to have its new users look on their return to solid fuel as a permanent changeover, rather than an emergency hardship to be endured only so long as it cannot be avoided. With the modern domestic coal-burning equipment, as efficient as it is, comparatively clean and nearly automatic in operation, they have and will continue to have a telling argument in their favor in view of the fact that coal is cheaper than gas in most localities. The gas house-heating load need not be given up as no longer attainable, but the idea that it can be won by default after the war will be due for a sad awakening.

Even more disquieting is the prospect of the electrical competition that will prevail, importuning every home in America for its domestic cooking and water heating load. Enormous increases in electrical generating capacity, now being built for industrial war work, will make cheap power a reality beyond the dreams of even such altruists as the planners of REA.

The combined marketing power of all of the electrical appliance manufacturers backed by the sagacious selling techniques of the electrical utilities will be strong enough to have a profound influence on a public already half convinced that the age of electricity is just over the horizon. For the gas industry to meet the impact of such competition it must itself be prepared to take the initiative, and to wage a campaign of far greater proportions than any that has ever been undertaken to date.

The questions to be considered are many, yet none of them can be ignored with impunity, lest in its failure to plan at all, the industry be planning for its own decline. Rate structures, for instance, which now indicate revision upward to meet the increasing costs of wartime operation, must be considered in the light of their competitive position with electricity after the war is over. Too-high rates can be just as fatal to utility expansion as too-low rates can be confiscatory. To the extent that the dead hand of yesterday's financial policies retard the possibilities of tomorrow's progress, that weight must be lifted if the gas industry is to continue its progress.

Where industry emphasis on minimum performance standards for appliances has hampered the efforts of manufacturers who would seek their success by building to new peaks of excellence in both merchandise and merchandising, such standards should be reviewed and revised. In the interests of public welfare, safety standards must always remain, but the question should be honestly faced whether minimum performance standards do not fetter rather than fire the imagination and ingenuity of the designers and the pioneers of newer and better gas utilization equipment.

The relations that will exist in the United States of tomorrow between publicly owned and privately owned utilities is another problem that cannot be solved by sentimental pilgrimages to the oracles of the past. Public ownership in some sections of the country, and in some segments of the political mind, is an accomplished fact. It is not on the decline, and its expansion will only be limited to the extent that the utilities are able to convince the public, and not merely themselves, that they are able to deliver a comparable service for at least a comparable price. Long range guerilla warfare between every privately owned utility and every public gas, electric or water project serves to convince no one, and merely keeps alive the controversy on which dissatisfaction often feeds.

The gas industry of tomorrow, we are confident, will be in the hands of gas men and not of bankers or lawyers or politicians. On them the responsibilities of peace will weigh as heavily as the obligations of war if the tradition of public service under private auspices is to survive. Certainly even in the present trying times they must plan how best they may serve in the bright new world that has been envisioned as the supreme reward of victory.

GAS at WAR

Washington Notes

Vital to War: The gas industry was included on a list of the 34 activities essential to the war effort, which was compiled by the War Manpower Commission last month for distribution by the National Headquarters of the Selective Service System to its agencies to guide local draft boards in granting occupational deferments to individual registrants. The statutory ban on group deferments is in no way altered. In the list of essential activities the gas industry was included under two classifications: (1) production of petroleum, natural gas and petroleum, and coal products; (2) heating, power, and illuminating services, which include gas utility companies.

Draft Deferments: If a draft registrant is engaged in an essential activity, consideration will be given to the occupation of that registrant within the industry, and if he is found to be a "necessary man," as defined by selective service regulations, he may be granted occupational deferment.

A suggestion has come from the A. G. A. Committee on War Activities that where an essential deferment cannot be secured because of non-recognition of the gas industry as essential, details of the case should be sent to A. G. A. headquarters for presentation to the Headquarters of the Selective Service System, which in turn can advise local authorities.

New Service Lines: The Power Branch of WPB ruled July 2 that the amended order P-46 prohibits running service lines from existing gas mains, even if only one foot, except on special authorization for each individual service. Application for such authorization, to be made by letter, must justify the service extension, must include an itemized list of the materials to be used, together with their dollar value. A sketch attached to the letter is helpful. A copy of the application should be sent to the Washington office of the American Gas Association in the Albee Building.

Preference Rating Order P-46, as amended, was further amended July 23 in Supplementary Preference Rating Order P-46-a to permit utility companies to make extensions to facilities for the Army, Navy, or Maritime Commission upon direct order by them.

However, it was provided that the total length of such gas or water main extension or the electric service line may not exceed 250 ft., and the total cost of material required for the extension may not exceed $1500 in the case of underground construction or $500 in the case of other jobs.

The purpose of the amendment is to enable the Army, Navy, or Maritime Commission to obtain extensions of electric, gas, or water service to barracks or other temporary buildings without prior approval of WPB.

Excess Stocks: On July 6 the WPB urged all utilities reporting under P-46 amended, to list with the Federal Power Commission all excess materials and equipment (appliances excepted) available for sale to other utilities. The dollar value of such excess materials offered for sale may be excluded from present inventory records required under P-46.

A utility company may sell materials from excess stocks or inventories to any other utility company or war production plants, provided the order for such materials carries a preference rating of A-5 or higher. This is provided for in amendment 2 to Preference Rating Order P-46, announced July 9.

Range Specifications Relaxed: Requirements that permitted type gas ranges must conform with certain safety and performance specifications were revoked July 4. This action, embodied in amendment No. 1 to Order L-23-C, was taken because it was found that the specifications in some cases did not result in the saving of materials.

Electric Ranges: (Limitation Order L-23-C.) Amendment No. 1 issued July 16 released for sale to the public some 45,000 electric ranges in the hands of dealers as well as ranges having a factory sales value of $80 and over in the hands of distributors and manufacturers. Ranges having a factory sales value of less than $80 in the hands of distributors and manufacturers must be held for defense housing or war agencies.

To qualify for a new electric range, a person must certify to the dealer in writing either:

(a) That a new domestic electric range is required to replace one that is worn out, damaged beyond repair, or destroyed;

(b) That no other cooking equipment is available, that the premises are wired for the installation of a range, and that electric facilities for range operation are installed.

WPB estimates that 70,000 electric ranges are now in the hands of dealers, distributors, and manufacturers. Of that number, about 25,000 will be held for defense houses.

Cast Iron Pipe: WPB through Limitation Order L-42 has directed that cast iron pipe shall be produced only in those weights generally known in the industry as "Victory," and that the production of "standard," "medium," and "extra heavy" pipe has been ordered discontinued. Maximum prices for the sale and delivery of "Victory" pipe are established by OPA Revised Price Schedule No. 100, as amended, using the Birmingham, Ala., single basing point system currently in effect in the industry.

Priority Assistance: A new service for applicants for priority assistance who use individual PD-1A certificates was announced July 7 by J. S. Knowlson, Director of Industry Operations.

If applicants will enclose with their application blank a self-addressed post card, the case number assigned to their application will be stamped on the card and it will be returned to them to facilitate handling of subsequent inquiries with respect to the application. All inquiries concerning applications should be submitted in writing.

Butadiene Allocated: Butadiene, basic ingredient for the manufacture of Buna-type synthetic rubber, was placed under allocation from producers June 27 by the Director of Industry Operations with the issuance of Order M-178, effective July 1.

Producers seeking to deliver and persons asking delivery of butadiene are required to make application to the Director of Industry Operations, Reference M-178. They are requested to use Form PD-33, which covers the production and shipment of all chemicals used in the manufacture of synthetic rubber.

Iron and Steel Appeals: Appeals by manufacturers for relief from restrictions imposed by General Conservation Order M-126, which banned the use of iron and steel in the production of hundreds of common civilian articles, will now be passed upon by a new appeals branch, set up within the Bureau of Priorities to handle all requests for exceptions to conservation and limitation orders.

Appeals from the terms of General Conservation Order M-126 must con-

tinue to be made on Form PD-437 and filed with the nearest WPB field office. Communications concerning M-126, other than the filing of appeals, should now be addressed to the Appeals Branch, Bureau of Priorities, War Production Board, Washington, D. C.

Pending selection of a permanent chief, Arthur L. Harris, Jr., assistant chief of the Bureau of Priorities, will act as head of the appeals branch.

■ ■

Meter Notes

Readings: To conserve materials and man power, The Consumers Power Co., Jackson, Mich., instituted the practice of reading domestic and commercial meters every other month. The new plan does not generally apply to industrial users. Bills will continue to be rendered monthly, but on the months that the meters are not read the charges will be one-half of the former month's bills, and these amounts will be deducted from the true charges when they are established by a reading the following month. Thus bills will be adjusted every other month.

Periodic Tests: The Indiana Commission in its "Rules and Standards of Service for Gas Utilities" effective July 15, has extended the periodic tests of meters from five to seven years. This follows the practice of many other state bodies which are liberalizing their meter testing rules for the duration.

Removal in Summer: In answer to the question that has arisen regarding the application of paragraph (e) of L-31 to those situations in which domestic meters are removed during the summer months and re-installed in the fall, an administrative letter, No. 7, from J. A. Krug, chief of the Power Branch of the War Production Board states the following:

"The Order does not contemplate that domestic gas deliveries made before March 1, 1942, shall be terminated merely because the meter is removed for the summer. Equipment which was receiving deliveries of gas at a particular location before March 1, 1942, may continue such deliveries despite seasonal suspension of service, provided that the equipment remains at the same location or in the possession of the same owner."

■ ■

Thanks From the Nipponese

War Production Drive Headquarters reports that a table has been installed to hold rejected parts in the plant of the Grayson Heat Control, Ltd., Lynwood, Calif. Over it is a large caricature of Hirohito with a happy grin and a line saying, "Thank you so much, please, for helping Japanese soldier."

Butadiene Production in California

SOUTHERN California Gas Co., Los Angeles, in cooperation with the Government, is making plans to utilize part of its gas manufacturing facilities for the production of butadiene to be used in the manufacture of synthetic rubber. Several companies, including the Southern California Gas Co., Firestone and Goodrich Rubber companies, Shell Oil Co., and Dow Chemical Co., have pooled their various technical skills and resources in the building and operation of the $30,000,000 project located in the Los Angeles area. Operation is expected to begin about March 1, 1943.

Experimental work is now under way at one of the gas company plants, with plans being rapidly formulated for the necessary changes and additions to permit production of butadiene on a manufacturing basis. J. G. Rollow, supervising engineer of the gas company, will devote full time to butadiene production and will be in charge of construction and operation. Guy Corfield, research engineer of the gas company, is conducting the research and experimentation necessary to the development of data for adaptation of the present plant facilities, and their control when operating on the new butadiene process.

Gas containing butadiene vapors will be produced from a light oil, and the butadiene separated and purified in adjacent new plants built for this purpose. Purified butadiene will be shipped to the combined rubber production unit, where it will be treated with the other necessary constituents to produce synthetic rubber.

Plans to build the $30,000,000 project which is to be a Defense Corporation plant, were confirmed by W. S. Harmon, chemical engineer of the Firestone Rubber Co., Akron, Ohio, who is in charge of coordinating the construction work. The various units of the project will cover 280 acres. Construction is being rushed through on a 24-hour a day program so as to meet the March, 1943, deadline. The anticipated output of the project is a military secret, but all production is to be turned over to the federal rubber reserve authorities for the duration.

Present plans call for Firestone and Goodrich Rubber Companies to operate the synthetic rubber production plants, Shell Oil Co. to provide additional butadiene, and Dow Chemical Co. to supply styrene.

A.G.A. Laboratories Active in War Projects

SATISFACTORY progress is reported at American Gas Association Testing Laboratories on several investiga- now under way for various branches of our country's armed forces and government agencies. This announcement discloses for the first time direct participation by the Laboratories in the war effort. Initial projects were undertaken early in May. Two contracts have already been awarded.

More recently, work was started on several additional assignments for which contracts are being negotiated. Four proposals for engineering and research studies have already been prepared and submitted to the supervising government agencies at their request. It is expected that contracts for their undertaking will shortly be let.

Projects already under way have afforded an excellent opportunity for the Laboratories to employ their testing and research facilities to further the war effort. The experience gained in the conduct of diversified research for the gas industry for many years provides a valuable background for undertaking many problems, particularly those to which an early solution is highly important to the armed forces. Availability of special equipment and trained personnel has greatly contributed to the progress already made in these assignments, many of which required the years of specialized experience obtained as the result of regular Laboratories' operations.

For obvious reasons it is not possible to attempt to elaborate on the details of the different assignments now under way. Considerable readjustment of Laboratories facilities and personnel has been necessary for their proper and efficient conduct. W. R. Teller, former chief testing engineer, has been appointed chief engineer of the newly organized war products department. He is assisted by W. H. Vogan, former supervisor of the Pacific Coast Branch Testing Laboratories. Nine Laboratories engineers now constitute the new department's technical staff. They have been selected on the basis of special qualifications needed for the proper conduct of the different problems now under way. As their number and scope increases, it is planned to transfer additional personnel. Decline in Laboratories testing operations under present wartime conditions has made possible the necessary readjustment of the force to undertake these new responsibilities.

Experiments on Tin Content of Solder

IN THE report of a special sub-committee of the Mid-West Gas Association, headed by C. B. Dushane, Jr., of the American Meter Co., Chicago, Ill., to investigate the possibility of obtaining relief from the solder requirements of WPB Tin Order M-43-a, as revised March 17, 1942, soldering experiments conducted by the American Meter Co., Albany, N. Y. The report is summarized in the following:

It has been proved by years of experience that 50% tin and 50% lead solder has had the suitable properties for the fabrication of new and repaired tinned steel case meters in such a way that the meters will remain gas-tight and safe for many years. However, because of the stoppage of tin shipments to the United States as a result of the conquest of the Malay Peninsula and the Dutch East Indies by the Japanese, it has become necessary to conserve on the use of tin. The Government has shown this formally by Conservation Order M-43-a curtailing the use of tin to 50% of the amount used in the corresponding quarter of 1940. At a later date, the more important amended Conservation Order M-43-a restricted the use of tin to not more than 40% of the amount of tin used in the corresponding quarter of 1940. This order also restricted the use prior to May 1, 1942, of solders having a tin content of more than 38% by weight, and the use after May 1, 1942, of solders having a tin content of more than 30% by weight. Because of this latter restriction, substitute tin solders have been sought.

The following constitutes a brief summary of experiments conducted with soldering alloys as furnished by the National Lead Co., Federated Metals Division of American Smelting Co., The North American Smelting Co. and American Metals Co., Ltd.

It is difficult to explain in general terms the effect of various elements on low tin solders. It can be said that:

1. Percentages of antimony up to 6% of the tin content of the solder enters into the solid solution and are helpful in preventing segregation of the alloy. Beyond 6% of the tin content the antimony acts as an impurity in the solder.

2. Bismuth up to certain percentages reduces the solidification range and lowers the melting point of low tin solders. From the soldering experiments previously mentioned it would appear that bismuth caused cracking.

3. Small percentages of silver added to lead produced a high melting point and high tensile strength solder. The 2½% silver solder is the eutectic mixture, consequently the solidification range is zero.

4. Copper in small amounts prevents segregation and ordinarily does not interfere with the working of the solder; but when the percentage of copper is greater than 0.20%, working difficulties are experienced.

There are two reasons why solders lower than 38% tin content cannot be used for the assembly or repair of gas meters. They are:

1. The long solidification range of low tin solders.

2. Shrinkage of low tin solders is greater than for 50/50 solders.

In conclusion, it is evident that there must be a solder containing the minimum percentage of tin for use in the manufacture and repair of gas meters. From the experiments conducted, 38% tin and 62% lead seems to be the absolute minimum tin solder that can be used. Any decrease in the tin, increases beyond the critical point, the solidification range that can be allowed for the fabrication or repair of tinned steel case gas meters. Neverthless, further experiments are being conducted in an endeavor to find a satisfactory solder having less than 38% tin.

The sub-committee report also included the following wire giving latest developments in the situation as of June 4:

June 4, 1942
Poughkeepsie, N. Y.

"Order M-43-a is being amended to permit gas companies to use solder with up to 40% tin content for meter repairing. We have no information as to when order will be officially released by War Production Board. Any gas company wishing to purchase any solder containing 40% tin should write to Tin Branch, War Production Board, and permission will be granted. Suggest letter be transmitted through office of George W. Bean, American Gas Association Representative in Washington.

(Signed) ERNEST R. ACKER, *Chairman*
Committee on War Activities, American Gas Association."

Requests should be addressed to E. G. Janeway, Tin Lead Section, War Production Board, Temporary Building R, Washington, D. C., and transmitted through George W. Bean, American Gas Association Representative, Albee Bldg., Washington, D. C.

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Insignia for Repair Squads

The Office of Civilian Defense has released the insignia for utility repair squads. A circular field of blue, inside of which is a triangle of white upon which is superimposed a pair of pliers. The design may not be altered or modified except that a word to indicate the particular occupation of the wearer may be added. For example, members of the utility repair squads of the Defense Corps of the gas company may add below the insignia "Gas" to indicate the utility serviced by the wearer.

The rules governing the use of this insignia and lists of authorized manufacturers of civilian defense insignia have been published by the Office of Civilian Defense under the dates of April 29 and June 18, 1942. These releases should be available through local defense councils.

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Order Ohio Gas Connection

WPB, in Directive No. 1 to Limitation Order L-31, has ordered Panhandle Eastern Pipe Line Co. and the Ohio Fuel Gas Co. to establish an interconnection that will permit the delivery of gas from the Panhandle company to the Ohio company in order to avert a gas shortage next winter in that part of central Ohio served by the Ohio Fuel Gas Company.

The pipe lines of the two companies join at the Indiana-Ohio state line between Muncie, Ind., and Dayton, Ohio. An interconnection can be made by simply opening a cutoff valve.

The order will permit gas from the Panhandle system to be delivered this summer and fall to the Ohio company, filling storage wells with gas to be drawn out when needed. There is no gas shortage now in the area.

In addition to this action, J. A. Krug, chief of the WPB Power Branch, July 27 wrote to the presidents of both gas companies requesing them to make arrangements for another interconnection between the two systems in the vicinity of Toledo.

Such a connection can be made, Mr. Krug said, by the construction of approximately 14 miles of line to connect the 22-in. line of Panhandle Eastern to Detroit with the 16-in. line of Ohio Fuel Gas near Perrysburg, Ohio.

Mr. Krug requested the two companies to file with WPB applications for priority assistance to obtain the necessary applications required under the Natural Gas Act.

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Scrap Rubber

While complete returns as to what contribution the gas industry made to the scrap rubber pile during the national drive last month are not now available, reports from several of the larger utilities reveal that the industry's rubber collection efforts were not inconsequential. Employees of the Gas Service Co., Kansas City, collected 53,579 lbs., which amounted to 357% of the quota of 15,000 lbs. set for the company by the New York office. Southern California Gas Co., Los Angeles, reported a 24,500-lb. total at the conclusion of the drive.

Industrial Nutrition

A nation-wide industrial nutrition program for war workers to be made available to managements of war plants through gas utility companies is now being developed and will soon be launched by Servel, Inc., of Evansville, Ind. This industrial nutrition project is an extension of Servel's Home Volunteer program which has been conducted wih success by many gas companies throughout the country.

This "Nutrition In Industry Plan" is designed to help step-up war production by building the health and morale of industrial workers through improving their eating habits. It will be carried on in conformity with existing Government nutrition plans and will utilize the best experience of the nation's leading home economists, nutrition authorities and research leaders.

The industrial nutrition program, is based on the pioneering experience in this field gained among the 5000 war workers in the Servel, Inc., plant at Evansville, Ind., and on a special nutrition activity carried on by the Bridgeport Gas Light Co., of Bridgeport, Conn., under the direction of Ronald A, Malony, sales manager.

The scientific phases of the program are being worked out in cooperation with the National Research Council which is making timely studies of wartime nutrition needs. These studies have provided indisputable proof that proper nutrition reduces fatigue and accidents; cuts down loss of time due to accidents; increases the workers' efficiency even under production schedules requiring greater speed and longer working hours. It also was found that proper nutrition improves workers' morale and health standards.

The industrial nutrition plan is being presented in a portfolio entitled "Nutrition In Industry" now being completed. It contains promotional and educational material, as well as factual and nutrition data for use by gas utility companies in connection with the industrial nutrition project.

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10% War Bond Program

With almost 100,000 of the nation's business firms already operating under the 10% voluntary payroll allotment plan for the purchase of War Bonds, the Treasury Department now has available for free distribution to firms employing more than 100 persons a promotional campaign complete with literature, posters, stickers and pay envelope enclosures. The material includes instruction on how to conduct the campaign.

Gas Engines Serve War Production

SHOWING an increase of 5.1% over last year's figures, the Gas Engine Power Census recently released by the Gas Engine Power Committee of the Industrial and Commercial Section reflects the increasing use of gas engines in war production. They are used both as prime movers and for the generation of electricity.

The period covered by the census, a study of the gas engine load served by the natural gas companies, ends with January, 1942, according to G. R. Walton, chairman of the committee, who also announced that the established method of rating engines at 75 lbs. B. m. e. p. and 1000 ft. piston speed had been followed.

With 49 natural gas companies reporting, at the end of 1942 there were 4452 gas engine accounts as against 4234 for 1941—an increase of 5.1%. The number of engines in operation increased 5.2%, rising from 7905 the previous year to 8316 in January, 1942. Total horsepower grew to 42,567 or 8.6%, from 495,726 to 538,293. It is interesting to note that the average horsepower per engine has risen 3.2%. Average annual gas sales per gas engine account were 3032 M c. f. Total annual revenue reported at the beginning of 1942 was nearly $2,795,310, or an average of 3.8% per account.

A number of the newer engine accounts are in war production plants, the committee reports, and it is expected that still more gas-driven power will be used in war production as the war tempo increases. In some sections of the country threatened electric power shortages have resulted in a number of gas engines being installed or ordered for various defense projects. These, it is reported, will be used both as prime movers and for the generation of electricity for plant use.

It appears that the synthetic rubber program may lean on the use of gas engines, and a sizable number of engines is being contemplated. The many alkylation plants producing high-octane gasoline are prospects for gas engines. An especially large application is found in the light metal plants producing aluminum and magnesium by electrolytic methods.

Exportation of Helium

Steps were taken last month to impose further restrictions on the exportation of helium under the provision of the act of September 1, 1937. Licenses authorizing export shipments of helium gas for medical, scientific and commercial use will be issued by the Secretary of State. In one year any one consignee or purchaser in any one country can purchase no more than 500,000 cu. ft. Quantities of helium gas that are not of military importance are defined as not exceeding 500,000 cu. ft. Applications for licenses to export helium are required to show that the gas will be used only for purposes indicated.

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P. G. & E. Employees Serve

First war deaths of employees of the Pacific Gas and Electric Co., San Francisco, so far reported were those of Paul R. Anderson, of Sacramento, killed in London by German bombers, and Sylvester John Barraza, Jr., of San Francisco, who lost his life in Alaska.

With 1018 employees of the P. G. and E., enlisted in the Army, Navy, Marine Corps, Air Corps and United Nations forces, the company has contributed 10% of its total force of over 10,000 employees to the war effort. In addition, a large proportion of the remaining employees, both men and women, are engaged in some sort of defense work, devoting their evenings to serving as Air Raid Wardens, Red Cross workers, etc. In the San Francisco area alone over 400 employees, 275 men and 125 women, have donated their blood to the Red Cross Blood Procurement Center, some two or three times, and the same holds true for other areas served by the company.

In the matter of purchase of war bonds the company employees are doing their share, one unit, the San Joaquin Power Division, has reached the 100% goal, for every one of the 1622 men and women employed by the company in that division has signed up for the purchase of war bonds regularly.

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Monthly Billing

In another conservation move, the Michigan Public Service Commission has authorized the use of postcard billing. To make this possible the omission of such data as the rate schedules from the bill is allowed, as "experience indicates that few customers check their bills and that those few could still do so by securing the rate from the standard rate schedules on file in the utility's office or by telephone."

British Comments on U. S. Utility Defense Plans

LETTERS received by Davis M. DeBard, vice president of Stone & Webster Service Corp., New York City, from gas executives in London, England and Edinburgh, Scotland, furnish pertinent comments on the article "Blue Print for Defense—Atlanta Gas Light Co. Prepares for Disaster" which was published on page 16 of the March, 1942, issue of *GAS*. These comments follow:

• EXCERPTS from the letter to Mr. DeBard from James Jamison, engineer and manager, gas department, City of Edinburgh, Scotland.

"I have to acknowledge receipt of your letter of the 18th March enclosing a copy of the March issue of *GAS* containing an article, 'Blue Print for Defense' by Atlanta (Ga.) Gas Co.

"I have read the article with much interest and, although conditions are probably different in the U. S. A. as compared with this country, I have pleasure in offering the following frank comments on the scheme described.

1. *Turning off gas supply.* Too much emphasis is laid on turning off consumers' services — it would be better to turn off only in cases where damage has occurred. This will insure that all available manpower is engaged on essential repair work and time is not spent in turning off and on supplies to consumers who have not been affected.

2. When turning off districts, mains must be kept "*live*" to prevent danger of internal explosion.

3. *Water-logged mains.* Stand pipes should be fitted at low points on the district and pumping units held in readiness for clearing water out of mains. This flooding of mains has been one of the principal troubles during extensive bombing in this country.

4. *Mains on fire.* These must be dealt with promptly in order to prevent the illumination acting as a target for further bombs and also to prevent destruction of property by fire.

5. *Pipes with mechanical joints* laid above ground are useful for temporary bridging of bomb craters. Special repair sections with air-inflated rubber seals have been evolved for the rapid repair of mains up to 48 in. diameter.

6. *Stocks of automobile tires and tubes* must be well maintained, as after a raid the streets are littered with broken glass.

7. *Telephonic communication* is extremely vulnerable to air attack and it is most important to organize an efficient messenger service which will enable contact to be maintained between control points. In the scheme described, too much reliance would appear to have been placed on telephones.

8. *Essential records and plans* should be duplicated and the copies dispersed.

9. *Essential plant and repair material* should be stored in small lots at many points throughout the district.

10. *Stocks of mains and fittings* should be maintained at a high level—the scale used in Great Britain is one length of each size of main per mile laid with a minimum of six lengths per size.

"Those would appear to be the most important points requiring attention to bring the scheme into line with our present experience.

"In order to maintain enthusiasm and efficiency it is desirable that exercises should be held at frequent intervals, and we have also found it very useful to prepare incidents and to exercise our staff in dealing with them, in training by actual bomb explosions—the eye to observe the damage, the ear to get accustomed to the horrible sounds, and the mind to record plans to combat same."

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• EXCERPTS from letter to Mr. DeBard from M. O. Coates, assistant to the engineer and general manager, The Croydon Gas Co., Croydon, England.

"Thank you for your letter of the 18th March and for the copy of *GAS* containing the article on the Atlanta Gas Light Co.'s preparations.

"I have read this latter with much interest, but find it a little difficult to constructively criticize without fuller information on any other sides of the company's general defense scheme.

"I suppose it is fair to assume that the most likely way the enemy might strike at Atlanta would be by attack from the air. This being so, I do not quite follow why the executives of the Atlanta Gas Light Co. consider it of such vital importance to turn off every consumer's meter should the gas supply be affected in any particular part of the area of supply.

"Even in the heaviest air raid we have always endeavored to keep a supply of gas to every part of our district; this has been necessitated not only because of factories engaged in war production, hospitals, and similar institutions, but also by the fact that it is at times of mental stress such as are engendered during a raid that the ordinary members of the public require hot drinks and food. It is probably true to assume that the first act of the majority of the population of Croydon on the sounding of an air raid siren is to make themselves a pot of tea!

"If, however, the gas works themselves were so severely bombed that production became impossible, it might then become advisable to turn off all *mains* in the district. Even in these circumstances I do not think it would be absolutely essential. It is surprising the amount of punishment that a works can take and still be capable of producing gas even in a limited supply. In these circumstances it might be necessary to reduce pressure severely on the works and district governors, as this is the only effective way of reducing consumption in the district.

"As you will realize, we have had a number of mains fractured by bombs and the supply to certain consumers interrupted thereby.

"When an incident occurs in the district involving damage to a gas main, the warden for that area reports it to his report center, which in turn passes the information on to us. We then send out a gang of men by car or truck with equipment for temporarily stopping any leakage of gas.

"During the air raids of the winter of 1940-1941 we frequently had to dig down, drill and bag off the main either side of the crater, but since then we have undertaken a very extensive valving program, and we can now segregate any sections of our mains of 12-in. and over and all the feeds thereto.

"As soon as it is possible repairs are effected and the interrupted service restored.

"We have always found the public are waiting for the supply of gas to come on again and it has not always been necessary to visit every house to warn them to light the pilot burners of any automatic appliances.

"As mentioned in my letter to Mr. Cuthrell, we have experienced a certain amount of flooding, due to the water from broken water mains finding its way into the broken gas mains in the same crater, and when this has happened we have had to visit the affected consumers' premises to empty the water from meters and possibly clear their service pipes.

"This flooding has been the main cause of small areas being without gas, but in no case has any consumer been without a supply for any length of time.

"I presume that in addition to the five plans outlined in the article, there are also emergency gangs available for dealing with bomb incidents in the district. We have been called out not only to cases where the bomb has fallen in the road and damaged the main, but also to incidents where houses have

been demolished and the gas service broken. The usual repair, if it has been a 'dirty' night, in this case, has been to place a plug of wet clay in the service pipe and leave the capping off until daylight.

"Although it is stated that arrangements have been made with the telephone companies to give utilities calls second priority, it seems to me that it is dangerous to rely too much on the telephone service, owing to the possibility of its breakdown. Although we make tremendous use of telephones, we also have dispatch riders available wherever our emergency gangs are located and their services have been required on several occasions.

"There is no mention made in the article of the availability of heavy gas-proof clothing and service respirators, in case of gas attack, or of means of de-contamination, should any employees or plant become contaminated by a blister gas.

"I see in plan No. 5 that it is contemplated that use may have to be made of radio announcements; we have never found this to be the case, nor has any use been made of loud speakers mounted on trucks.

"I fear that the above comments are of rather a rambling nature, and there is a great deal more I could tell you from our own experience, but to summarize my criticisms: if the whole of the preparations made by the Atlanta Gas Light Co. are as detailed, then they are not adequate for dealing with the trouble as it may occur. It appears that far too much effort will be spent on turning off individual meters without proper precautions having been taken in dealing with the actual bomb incidents themselves."

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o EXCERPTS from the letter to Mr. DeBard from Michael Milne-Watson, The London Regional Gas Centre, 30, Kensington Church Street, London, W. 8, England.

"In your letter of the 16th March you ask what we are doing about tires for our repair trucks. We are obtaining these through a special permit from the Board of Trade and have had no difficulties to date. You will no doubt have heard that private motoring in this country is to cease entirely next month.

"You ask how women are standing up to the heavy work in the gas plants. They seem to be adapting themselves excellently and are liking the work. With regard to meter reading and coin collection, the women are rapidly approaching the men's standard of output and, in some cases they have exceeded it.

"A new development with which we are experimenting in the Gas Light & Coke Co. is joint meter reading with the electricity undertakings. We hope to follow this with joint use of showrooms.

"On the 18th March you sent me a copy of *GAS*, which included 'Blue Print for Defense. Atlanta Gas Light Co. Prepares for Disaster.' I was most interested to read this, especially as you ask for our candid comments. We are full of admiration for the plans which the Atlanta company have been making, although one or two items call for special comment.

"First of all, the plans you have made to assist turning on meters, lighting appliances, etc., for which you have trained 300 men. Our experience is that with intense local raiding it is impracticable to do this and that, in fact, consumers are perfectly capable of turning the gas on and off themselves. All available gas company personnel is fully occupied in repairing damage.

"Secondly, your plans provide for the cutting off of industrial consumers first and domestic last. This is the exact reverse of our policy.

"On the subject of special tools and equipment such as asbestos suits, spark-proof sledge hammers, etc., I think you should know that in actual fact we have, as far as my experience goes, never used an asbestos suit under actual raiding conditions. The suits are extremely clumsy, suffocating hot and, unless provided with a safety belt, extremely dangerous. We have very little use for the special tools; men work best with the tools with which they are familiar and if safety tools are considered necessary, we think they should be introduced into ordinary use."

Fuel Rationing in Great Britain

By STANLEY JENKS*

SHOULD it become necessary, our British friends have a ration coupon plan already worked out for domestic fuels—gas, coal, oil, and electricity. The plan is on a "points" principle, in which the basic ration for a household will be determined by the number of habitable rooms, plus a personal ration for each dweller in the house.

While the unit has been established as one cwt. of coal, a fuel user will be able to take his ration in coal, coke, gas, electricity, or kerosene. The cwt. of coal unit will be equivalent to five therms of gas, 100 kwhr. of electricity, or two gal. of kerosene.

The basic ration in cwt. of coal annually has been scheduled as follows:

Number of Rooms	*Scotland and North of England*	*Midlands*	*South of England*
1	40	30	25
2	45	35	30
3	55	45	35
4	60	50	40
5	70	55	45
6	75	60	50
7	85	70	55

Over seven rooms, householders will have to show sufficient residents or special circumstances to justify more. The ration per extra room will be 15 cwt. in Scotland and northern England, 12.5 cwt. in the Midlands, and 10 cwt. in the south.

The personal ration will be the same for all, young or old. It will be 7.5 cwt. a year per individual. Thus, a family of four will be able to get 30 cwt. of coal a year, plus the basic ration of 50 cwt. if living in a six-room house near London, or a total of 80 cwt. for the year. Translated into gas, this amounts to 400 therms a year for cooking, water heating, home heating, and miscellaneous uses. With 1000 B. t. u. natural gas, the hardy Londoner would have to get along on 40,000 cu. ft. per year.

Coupons will be turned in when the gas bill is paid. Small excess consumptions will be debited against the next period and reported to the local fuel overseer. But woe betide the chiseller and fuel hog. According to the decision of the local fuel overseer, any larger excess users will be subject to prosecution and a fine amounting to 10 times the price per unit of all in excess. The courts will be empowered to shut off all fuel supplies of chronic offenders.

Commercial establishments, other than residences or industries, will be allocated fuel based on a percentage of previous consumptions. The local fuel overseer will decide the amount, with a right of appeal. Such establishments will, furthermore, be expected to comply with restrictive regulations governing the conservation and more efficient use of whatever fuel they use.

We have described the plan because it is interesting to American gas men and perhaps indicates a path along which we may have to travel before Schicklegruber has been permanently heeled and helled.

*Mr. Jenks, formerly editor of *GAS*, is now with the Welsbach Street Lighting Co., Philadelphia, Pa.

GAS INSTITUTE TRAINING AIDS WAR EFFORT

Summer Employment by Gas Utilities Gives Fellows Practical Experience

By LINCOLN R. THIESMEYER

Student Counselor, Institute of Gas Technology

IN THIS, the third in a series of progress reports published in GAS on the activities of the Institute of Gas Technology, Mr. Thiesmeyer deals primarily with the education program and summer training of the Institute Fellows who have this year stepped directly from the classroom into the practical everyday operations of the gas industry through their summer employment by various gas utilities throughout the country. It also outlines briefly the notable success made by the Institute during the past few months in setting up the curriculum and building the library. The former articles, GAS, October, 1941, p. 27, and GAS, May, 1942, p. 34, presented detailed information on the organization, financing, the staff and the appointments to fellowship.—Editor.

THIS summer 15 young men who hold graduate fellowships at the Institute of Gas Technology in Chicago are serving the country in the vast "production army." In chemical laboratories, research and engineering development departments, field stations and manufacturing plants of the gas industry, from coast to coast they are utilizing their special scientific and technical training to help speed production and to promote national safety and health. For three months from June to September each of them is a student-employee gaining practical experience and intimate knowledge of the industry he is preparing to enter in a technical capacity upon completion of intensive advanced studies at the Gas Institute.

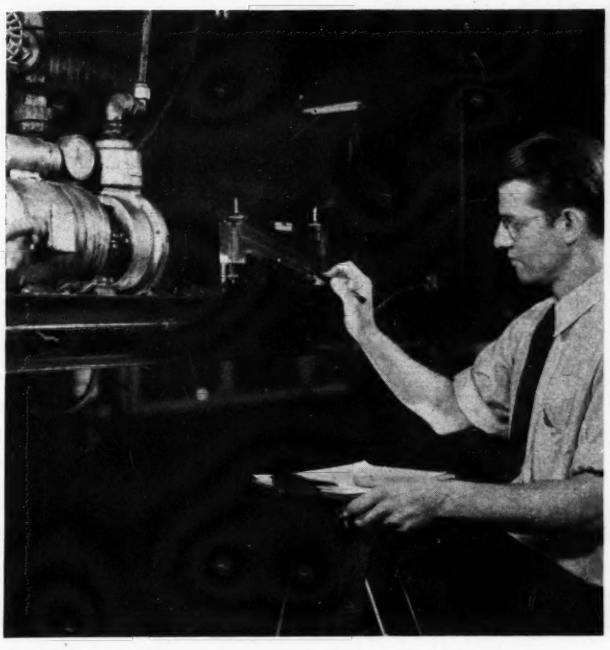
The summer employment-training is a required part of the Institute's educational program. At present, this is serving the dual purpose of assuring a supply of highly specialized manpower to the gas industry for long-war and post-war needs, and of making a selected group of high-caliber men available directly to war production during part of their time as graduate students. Local Draft Boards have been quick to appreciate the importance of this program in the all-out victory effort. Deferments are being granted to Institute Fellows so that they may continue their studies in fields of science and engineering in which critical shortages of specially skilled men have become apparent. This is in line with the military policy of the government as outlined in recent interpretations of Selective Service from Washington.

The Institute of Gas Technology, now in its second year of operation, was established in June 1941, only a few months before Pearl Harbor. (GAS, Sept., 1941, p. 40) It is fortunate that this institution, destined to play a vital role in the war effort, was already functioning with its first small group of students when Japan audaciously bid for her own annihilation. Stimulated by the country's demand for trained scientists to direct technological development, this new educational and research organization, located at, and affiliated with, the Illinois Institute of Technology and directed by Harold Vagtborg, is growing rapidly and has geared its entire program to contribute to the ultimate triumph of the United Nations.

Along with most of the top engineering schools in the country, the Gas Institute has accelerated its schedule. Unlike these schools, however, its curriculum was originally set up to require full-time work throughout each year. This course of study is too intensive to be covered adequately in less time. There was, therefore, only one way to speed up graduation of each class. This was to place appointees of the Institute's incoming class, who would ordinarily have begun their work in September, directly into the gas industry to start their practical training immediately upon graduation from college. Consequently, the whole student group is at present doing "laboratory work" in 11 of the 45 companies that are now contributing to the support of the Institute. As a result, these men, upon completing their graduate education, will become available that much sooner for key positions in the industry.

The student-employees are exceptionally capable young men. Each holds a bachelor's degree in either chemistry, chemical engineering, or

Frederick O. Sharp, Jr., compiling statistical data secured in a confidential research project.



Henry E. Robison securing data on operation of air conditioning equipment.

petroleum or gas engineering, and one has a master's degree in physical chemistry. Three have already completed one year of work at the Institute. All of them were selected on the basis of high scholarship and leadership qualities for appointment to fellowships of $1000 annually. They come from 11 states and were chosen from 13 of the 56 colleges and universities at which over 200 eligible candidates were considered during the past year. Their graduate studies will lead to the master's degree in two years and the Ph.D. in gas technology in two more. The need is urgent for an increasing supply of such men whose training extends beyond college study.

Each succeeding summer during his graduate program a Gas Institute Fellow will work in a different type of company in a different part of the country. If, for example, this summer he has been dealing with gas-fired furnaces so important in the heat treating of armaments, next summer he may be employed in the control laboratory of a gas manufacturing plant, and the following year he may work on the distribution system of a natural gas producer. In this way his increasing technological skill will be used in varying phases of the industry, and he will be thoroughly trained not only in war production but also in the techniques of building of the tremendous production capacity needed for the reconstruction of a shattered world.

This summer the boys are at work in 8 states and are scattered from Boston to Los Angeles, from Rochester to Houston, from Atlanta to Denver. One lad from Colorado is in southern California; one from Texas is in Georgia; a boy from Wisconsin is in Massachusetts; and another from Colorado is in Ohio. A native Oklahoman has been working on a project in New York that necessitated travelling to consult experts in six major eastern cities. Such wide geographic distribution of the students is occasioned by the comparable distribution of the supporting companies, and by the desire of the Institute that its trainees acquire the poise and breadth of viewpoint that comes with an experience of living among people in different parts of the nation.

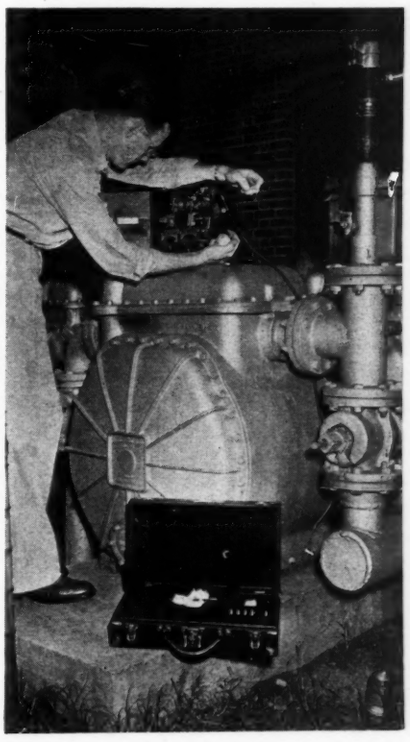
The Institute requires that each student-employee send a weekly written report describing briefly the nature of the work on which he has been engaged. It gives the names of his immediate supervisors and associates, cites technical literature he has studied, outlines problems in the solution of which he has aided, and indicates the new techniques and types of apparatus with which he has become familiar. One copy of each report is submitted to the employer and one is held in the files of the Student Counselor of the Institute. The boy is, of course, urged to secure clearance from his supervisor before including confidential information that may preferably be withheld. This is especially important now when so many companies are engaged in war work.

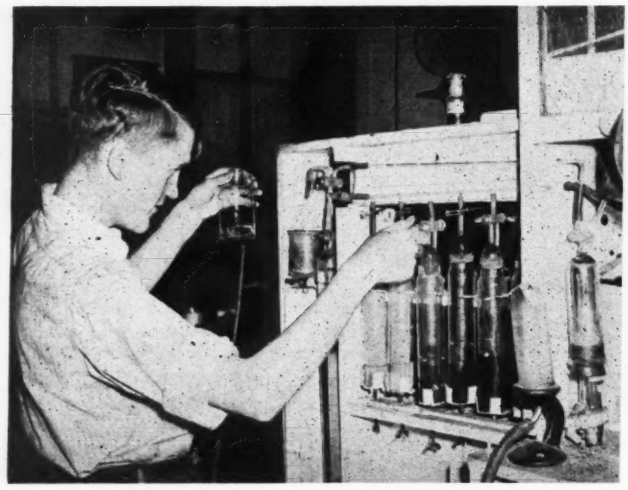
The reports keep the Institute constantly aware of the experience each man is gaining. They will aid both in guiding his further training and in placing him most advantageously to the industry in the future. Criticism of the reports constitutes part of the education in technical writing which is considered of prime importance to development of well-trained scientists.

Reports received during the first six weeks of this summer indicates that the abilities of the Fellows are being utilized in an amazing variety of jobs. Moreover, within some of the employing companies the boys have been given invaluable opportunities to learn many aspects of the gas business in a short time by transfer through several departments. This has not been possible in all cases, however, and has been done only where it would not minimize the value of the man's summer work to the company. Enthusiastic comments received by the writer from employers are supplying qualitative evaluation of the work outlined in the students' weekly written reports. Rehearsal of specific details in this employment-training program is contrary to Institute policy, but a review of some of the work will suggest the nature and extent of the contribution Gas Institute students are currently making to the war program.

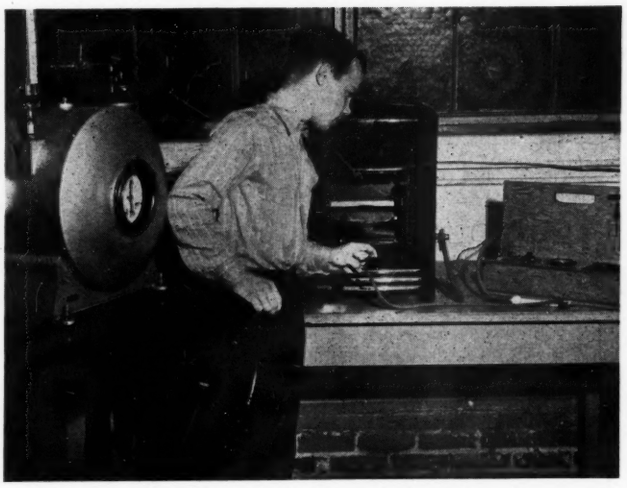
Many manufacturers of gas-fired equipment have converted their production lines to turning out parts for tanks, guns and other war material. In one such company, a Gas Institute Fellow had been in the engineering department studying operating characteristics of new types of burners. When

Richard A. Nevill testing a positive displacement meter with a critical flow prover.





Robert M. Newhall analyzing fuel gas (coal gas) on a slow combustion gas analysis apparatus.



Roy C. Feber checking a primary air control device as installed in the venturi mixing tube of a space heater gas burner.

the company became shorthanded on rush orders, he was placed right in the production line. He rolled up his sleeves and carried his day's work as cheerfully and readily as more experienced men beside him until he could be replaced — and it need scarcely be added that in this experience he learned unforgettable things about the workers who are turning out the instruments of victory.

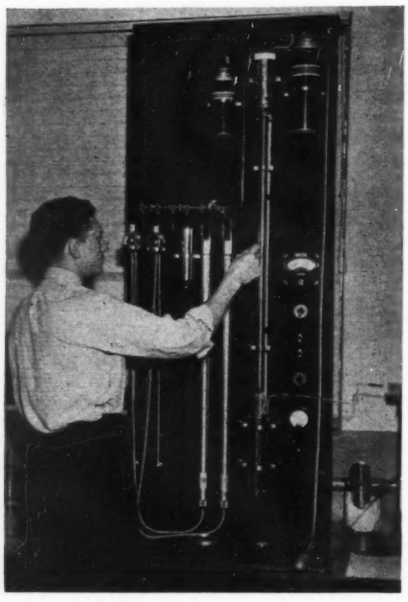
A young "rookie" working for a manufacturer of gas furnaces was sent out as a trouble-shooter to a war plant using such equipment, to diagnose and correct efficiency-reducing difficulties in their operation. Although he had had little experience with such furnaces and only meagre instruction as to procedure, he attacked the problem systematically and soon discovered the adjustments needed. Directing a crew of pipe fitters, he brought the furnaces to proper efficiency and was back at the home office long before his supervisors had expected to see him. Now, for contrast, he is handling clerical work in the production control department, scheduling the purchase, storage and use of critical materials. Next week he may be back in the engineering department drawing graphs of relationships found in testing burners to guide the design of improved equipment for heat-treating war metals, or in the research laboratory studying chemical characteristics of refractory brick.

▲

Richard A. Nevill designing feeder mains.

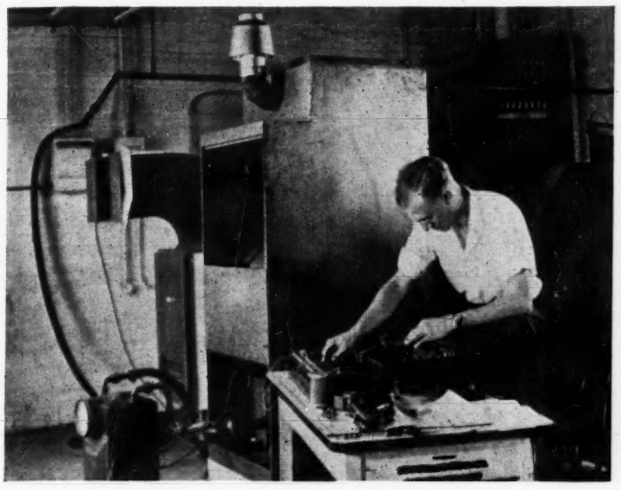
▼

Thomas L. Pelican conducting a gas fracfractional distillation analysis.



One of the petroleum engineers began his summer work with a gas utility at a most opportune time. The company is contemplating expansion of its production and storage facilities to meet the increasing demand of war industries for gas. This includes construction of a large absorption tower for sweetening sour gas and of a storage tank for liquefied gas. The high degree of ability of this young man and the excellence of his previous training are such that he has been in on the ground floor of many phases in the planning for both installations as well as engaging in other activities of the company.

The chief engineer, chief chemist and plant superintendent of the company were quick to sense not only this boy's capacity for contributing to several of its technical operations but also their opportunity to test his varied potentialities as a possible future employee and their obligation to the Institute to aid in training him for the good of the entire industry. Consequently he has already participated in a long list of diversified activities, with nearly a month more of similar experiences still to come. He has helped materially with design of the absorption tower, of equipment for handling sulfur in natural gasoline, and of a treating plant for boiler feed water. He listed materials needed for the pro-



Leonard E. Savory included among his summer activities the laboratory testing of a furnace.

John W. Selph, Jr., gained practical experience in checking operating characteristics of refrigeration equipment.

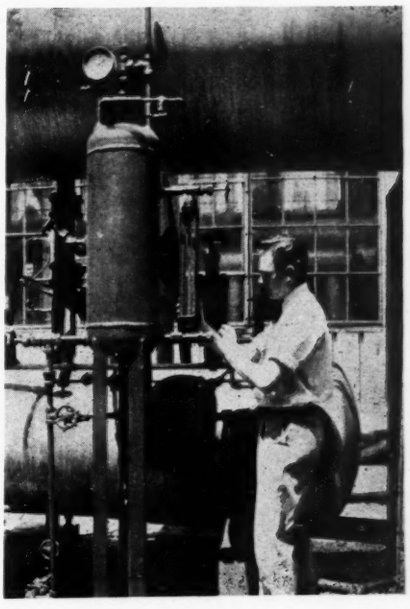
Richard A. Rall, Jr., making engineering calculations.

posed equipment, studied methods of water purification and of sulfur and hydrogen sulfide removal from gas, and experimented with substances to be used as a coagulator in the boiler feed. He has drawn flow diagrams and isometric sketches, helped to survey and lay out a driveway for a natural gasoline plant, studied insulating materials for the proposed liquid gas storage tank, experimented with flow nozzles for the absorption unit. Last week he was making pH analyses of soil samples from the site of the new liquid gas tank. In addition, he has made specific gravity determinations, learned the theory and operation of a Junkers calorimeter, and made H_2S analyses. Somehow in between he has also found time for reading gas journals and sections of Stephens' book on natural gas engineering.

Much has been written in recent months about the value of huge arteries from the heart of oil and gas fields to the throbbing pulses of the nation's war industries. Fortunately, some of the Institute's students are also learning to control and measure the flow in the main trunks and ramifying veins of gas distribution networks. One of these "cadet engineers" spent his first month working on a natural gas system moving from one location and phase of its operations to another, gaining an overall picture of procedures and problems. At the conclusion of this orientation he settled down to do more concentrated work in those branches of the company that interested him most. Trained at one of the country's foremost schools in petroleum engineering, he was well prepared to begin in the lease and land department, to help locate a well and work on well completions, to test rock pressures, or work on acidizing. He has studied the operation and repair of main compressors, auxiliaries, recompressors, gasoline and boiler plants; he has run Podbielniak and Orsat analyses, tested gas well flow and sulfur content, run water analyses and specific gravity determinations, worked on a dehydration problem and on warehouse records, checked and repaired orifice meters and checked positive displacement meters. And the summer is still only half gone.

Two of the boys working for different companies in widely separated regions have also devoted much attention to proper gas measurement. This activity, important in peace, is critical in the complicated economy of war. The students have been testing and correcting domestic and industrial meters of various types, compiling data from leak surveys, or drawing layouts of proposed main extensions and pressure changes. On the side, one of them has read books on the history of the gas industry and studied papers on pressures in distribution systems and on

Willard M. Dow checking level of liquid in condensate accumulator tank.



the production of water gas. The other has gained a rather comprehensive view of his company's operations by observation as he moved from place to place throughout the distribution system correcting industrial positive displacement meters.

Two of the Institute's students have been engaged in a research project which is strictly confidential because of its vital significance in the war program. Their work has involved studies both in engineering and economic aspects of the problem. They have been sent to several major cities in a critical area to consult with experts and to gather important statistics. This experience is giving them an unusually broad concept of the gas industry's operations.

Two young chemists and one of the chemical engineers have been busy in the control laboratories of several gas manufacturing utilities. One of them has run H2S analyses of the purification system, prepared coke and coal samples for analysis, run Orsat analyses and B.t.u. measurements and performed routine moisture determinations on steam coals. Another has devoted much of his time to problems and techniques in sulfur removal, including some dismantling and cleaning of equipment to study its functioning. The third man has run boiler scale and flue scale analyses, distillations and viscosity tests on tars, gravity tests of naphtha samples. Recently he has learned the operation of a fractionating column, helped with its construction and is engaged in confidential research involving its use. He has also done some work with a spectrophotometer and is reading Morgan's classic books.

Refrigeration and air conditioning are fields whose significance has also increased with the war. Two Institute Fellows have been studying the operation of domestic and industrial units of various sizes and testing their performance with recent modifications in design. One of the boys developed an instrument for use in control testing and is now working on a secret device intimately related to national defense.

In one appliance laboratory, a student has become thoroughly acquainted with a wide variety of furnaces by running efficiency studies on them for a comparative tabulation. He has taken down and reassembled heaters, valves, pilots and other appliances and helped to obtain data for improved design. Such research is aimed, of course, not only at its possible application to the war effort, but also at post-war survival of a company that has now turned almost all of its plant to producing offense material.

Erwin R. Strong, Jr., checking 5 lt. test meter for gas time preparatory to making critical flow test.

In another appliance laboratory, a Fellow has been experimenting with gas burner orifices, investigating air-gas ratios and flame characteristics, studying flue cowls, familiarizing himself with calorimeters and gravitometers, and studying mine safety devices. At the end of the summer, he will be permitted to spend a week or more in the chemical laboratory of the same company as an observer. Here under the personal guidance of a supervisor he will gain a comprehensive view of analytical procedures and control tests that constitute its functioning. This is typical of the cooperation in the Institute's training program which its member companies have so readily provided this summer.

Gas Institute students receive monthly salaries during periods of employment-training and their travelling expenses to and from the jobs are covered. The rate of compensation, fixed by the Board of Trustees of the Institute each year, has been $125 a month. This does not compare with much higher rates currently offered to young graduates in engineering and chemistry, but it is adequate to cover living expenses. The boys properly regard the summer work as a vital part of their education. They recognize that in moving them around within his organization each employer may be sacrificing some of the productivity the student might develop through more intensive work in a single capacity. When they accepted fellowships at the Gas Institute in the first place the boys also made a temporary sacrifice. They miss the high financial return and rapid advancement of industrial work for awhile; but they gain an unique opportunity for improved usefulness to the industry and the nation in the future. And this must bring substantial rewards as each one later demonstrates to the industry the much higher value of his expanded technical skills.

The number of companies supporting this program will always be greater than the number of students available, because the maximum of new fellowship appointments each year is fifteen. Furthermore, a single company may be eager to employ more than one student each summer. (This year one company wanted to take eight!) Consequently there should be considerable choice to the Institute in scheduling placement of its students. Arrangements for employment are made through the Student Counselor in such a way that the contributing companies also have an opportunity to express preferences in selecting trainees or permanent employees.

While the students out in industry have been participating actively in the overall war program, back in Chicago the research staff of the Institute has also been busy on studies of victory production problems. The Catalysis Group under the supervision of Dr. Vasili I. Komarewsky, Professor of Chemistry at Illinois Institute and part-time member of the Gas Institute staff, and Dr. Charles H. Riesz, Research Associate in Organic Chemistry and

Catalysis, has been working on improvements of process for the production of synthetic rubber from gas. The significance of this research is too obvious to require elaboration. Another group consisting of Drs. R. Lowell Hicks, Edward R. Tompkins and Professor Robert C. Kintner has been engaged in studies of the removal and identification of organic sulfur from gas, problems whose ramifications extend into many branches of industries using gas for war production. Drs. Hicks and Kintner are working on a project sponsored by the Rochester Gas and Electric Corp. (GAS, May, 1942, p. 36) for removal of this troublesome constituent. Dr. Tompkins, recently from the University of California, who was added to the staff a short time ago is developing procedures for the isolation and identification of organic sulfur compounds in gas. This project is jointly sponsored by the Rochester Gas and Electric Corp. and the Organic Sulphur Subcommittee of the American Gas Association.

Other members of the staff have been active in organizing the curriculum and preparing the facilties for the educational program of this new institution that is demonstrating its usefulness to national defense. Dr. Julian F. Smith, Technical Librarian and Editor, has already supervised the acquisition and arranging of about a thousand volumes for the Institute's rapidly expanding library. This includes virtually complete sets of important journals dating back nearly a century, numerous dictionaries in foreign languages and most of the important modern textbooks on subjects relating to gas technology. The library now has subscriptions to most of the important periodicals. Equipment for reading microfilm and for microfilm photocopying has also been added. Such notable progress in the development of a working library inevitably proves a stimulus and aid to any research program and an invaluable asset to course work. Dr. Smith, who can intertranslate the scientific literature of 13 languages, is preparing an abstract review in gas technology that represents one of the primary functions of the Institute—to correlate and desseminate scientific information.

Under the supervision of P. J. Fitz-Patrick, Supervisor of Laboratories, a 50% increase in space is being arranged to provide additional laboratory facilities and offices in the building at 3325 South Dearborn Street, Chicago, which is temporarily occupied jointly by the Institute and by divisions of the Armour Research Foundation.

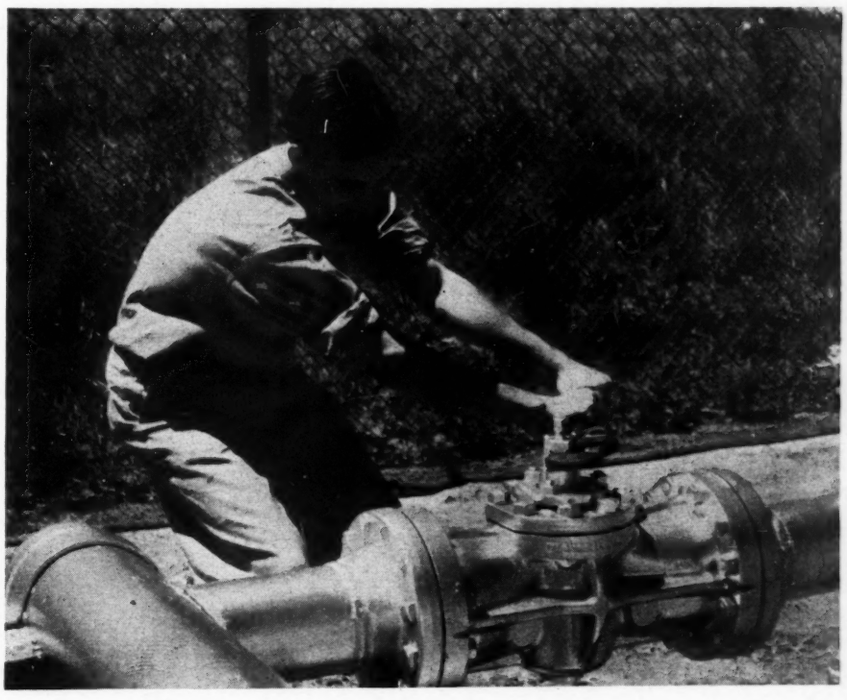
A curriculum, drawn up in consultation with representatives from the gas industry, has been approved by the Institute's Board of Trustees and the first catalog is in preparation. The plan of study is arranged year by year to provide advanced work in basic sciences (chemistry, physics, geology, mathematics) during the first year, and engineering essentials (fluid flow, heat transfer) during the second. The third year is largely devoted to work on ownership, operation, management and regulation of the gas business, and the fourth year to doctorate research. The curriculum also includes courses in fuels and combustion; gas hydrocarbon derivatives; unit operations of the gas industry; constitutional, corporation and patent law. Such a comprehensive plan of study does not duplicate any existing program in gas engineering or fuel technology. Research and theses are required for both of the graduate degrees, and a reading knowledge of French and German is demanded for the doctorate.

An additional feature of the curriculum is a general survey orientation course to the gas industry given as a seminar during the first year. This will be attended by both staff and students and the speakers will be outstanding men chosen from the industry. As a part of this course, each student will give a final oral report on non-confidential aspects of his summer employment-training. Both content and presentation of these reports will be criticized since one policy of the Institute is to develop the overall effectiveness of its students as well as their technological skills.

The writer has already begun a schedule of visits to college and universities to lay the groundwork for selection of the next group of fellowship holders. He is interviewing seniors in school during the summer session who will graduate this coming winter on accelerated schedules. A large proportion of the next group of appointees will probably be chosen by Thanksgiving. Those selected will become Fellows immediately upon graduation with the bachelor's degree, regardless of their graduation date, but the advanced work will begin with employment-training in the gas industry. Arrangements for this will be made through the Institute. The new Fellows will remain in the industry until September 1943, perhaps shifting from one company to another at the end of three or four months. The thesis research and final graduation of such men will then be moved forward by a comparable number of months. Men who are to graduate from college next June are, of course, also being considered for fellowship in the same entering class.

The Institute of Gas Technology was founded by a group of imaginative men, sensitive to the need for specialized training directed to the service of a single broad industry and alert to limitless potentialities in research. Support from a growing number of separate companies indicates recognition that the fundamental philosophy and plan of operation are sound.

William R. Johnston regulating gas to Camp Carson, Colorado Springs, Colo.



Plugging Low Pressure Mains with Bentonite

EXPERIMENTS, under what might approximately be termed actual conditions to be encountered in case of bombing, have shown that bentonite gel may be introduced into low pressure gas mains to shut off the flow of gas and extinguish the fire in a reasonably short length of time. The bentonite gel has been introduced through an existing service, and also through a curved pipe by way of the broken end of the gas main from which burning gas is issuing, and it appears that either method may be used, depending upon the specific conditions.

Bentonite gel is prepared by mixing bentonite powder into water. This gel has the properties of a plastic solid and for this reason is valuable for plugging a low pressure main in case of a break. The fact that bentonite is a plastic solid means that when a slug of bentonite is placed in a pipe line a certain critical pressure is necessary to move the slug, but above that pressure the gel will flow as a viscous fluid.

It has been found that a gel containing 16% bentonite by weight is about the best mixture for this purpose. This corresponds to 19.05 lbs. of bentonite for every 100 lbs. of water, and this ratio must be maintained very accurately since even a small change in this ratio makes a large change in the properties of the gel. This mixture can be pumped readily with the grease gun through the average service line.

In the case of a line break the bentonite can either be pumped in through a service line or, if the end of the pipe is exposed, the bentonite can be pumped directly into the open end of the pipe. The bentonite is pumped with a Lincoln heavy duty airline drum pump, 400-lb. drum size, model 1757. This drum pump has a 6-to-1 pressure ratio, hence 100-lb. air pressure will give 600 lbs. on the bentonite; sufficient for the job. The pumps cost $187.50 each and following plates $2.50 each. The pump is connected to the service with 1-in. hydraulic hose which has a safe working pressure of 2500 lbs. per sq. in. The hose costs $1.54 per foot and the boss couplings cost $2.95 each.

The bentonite used in the tests was a 200-mesh powder obtained from the Griffin Chemical Co. The cost of the bentonite is between 1¢ and 2¢ per lb. and since one pound of powder makes 6.3 lbs. of gel, total cost is reasonable.

The bentonite and water are mixed with an air-driven stirrer in about 50-lb lots. The stirrer blade used consisted of a loop of strap iron about $\frac{3}{16}$x$\frac{1}{2}$ in. and was about 24 in. long. This loop was attached to the shaft of an Ingersoll-Rand multivane grinder.

Any type of stirrer which will give strong agitation would be satisfactory. A mixing device called the Sperser, developed by the American Colloid Co., Chicago, Ill., will produce gels as thick as 20% Volclay concentration, filling a 50-gal. barrel in about 15 minutes.

The bentonite is mixed, stored, and pumped from 100-lb. grease drums 13 in. in diameter and 27 in. high. These drums each hold about 135 lbs. of gel, the density of which is about 66 lbs. per cu. ft. The bentonite gel will keep indefinitely without change in its properties when stored, if it is kept covered so that no evaporation of water can take place. When the bentonite is mixed the water is first weighed and placed in the drum. The bentonite is then weighed, the stirred started, and powder added slowly with strong stirring.

The drums of bentonite gel can be readily tested by means of a test rod made for this purpose, consisting of a 3-ft. length of ¼-in. welding rod with a cylinder on the upper end. The weight of the rod was 0.50 lbs., and that of the cylinder 0.62 lbs., making a total weight of 1.12 lbs. With this weight the rod should sink 18 in. into a 16% bentonite gel to be of the correct strength; if the rod sinks farther, the mixture is too weak and if it doesn't sink that far it is too strong to be pumped readily, the allowable limits being about 2 in. in either direction. The purpose of the cylinder on the test rod is merely to add weight to the rod. This is a simple method of checking the shearing strength of the gel. The rod will slowly sink to a certain depth and remain there, this depth depending on the shearing strength of the gel.

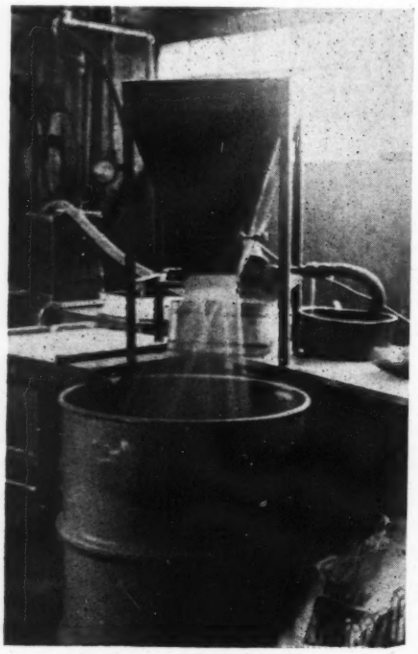


FIG. 1. Sperser making gel used in stopping gas main leaks.

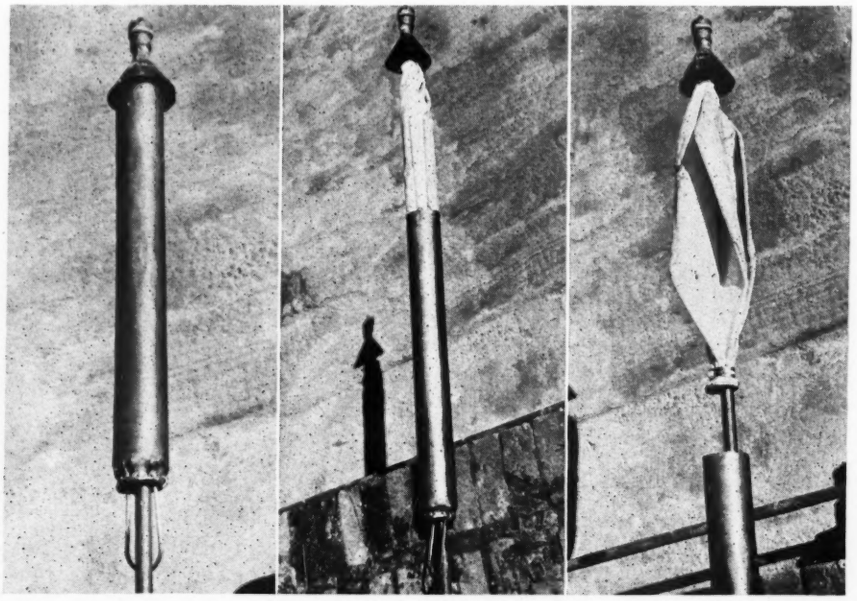


FIG. 2. Bentonite shut off: (Left) Closed position, cigar-shaped bag is wrapped tightly around pipe and protected by a sleeve of 3-in. flue pipe. (Center): The bag partly open. (Right): The flue pipe is pulled back by means of a cable, and bentonite gel is pumped into the bag, after the end is inserted into the broken main and shoved past the fire.

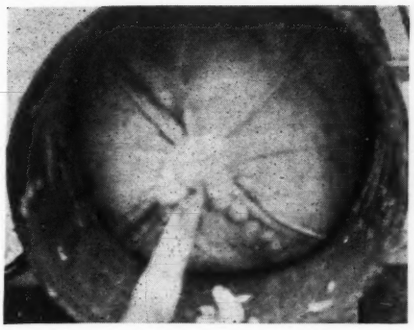


FIG. 3. The bag fully inflated with bentonite gel after protecting rod and sleeve have been removed.

This can also be determined by measuring the pressure necessary to force a cylindrical plug of bentonite out of a short length of pipe.

The pressure necessary to start movement of a cylindrical plug of bentonite in a pipe is given by the equation:

$$P_1 = \frac{4 F L}{D}$$

Where P_1 = pressure necessary to start flow (lbs. per sq. in.).
F = shearing strength of the gel (lbs. per sq. in.).
L = length of the plug (ins.).
D = diameter of the pipe (ins.).
for 16% gel — $F = 0.1$.

This equation is very important, as it can be seen that if the shearing strength of gel is too great, the length of the service line is too large, or the pipe diameter is too small, it will be impossible to move the slug with a given pressure. The amount of bentonite necessary to block a gas main will be about three times that calculated from this equation, as it tends to slump on both ends, especially downstream.

The amount of gel necessary to block a pipe against 12 in. of gas pressure, using a 16% bentonite mixture is:

Pipe Diameter	*Weight Lbs.*	*Overall Length of Plug (Ins.)*	*Distance from Service to Downstream End of Plug (Ins.)*
6	23	29	21
8	54	39	27
10	106	49	34
12	183	56	41
16	430	79	54

It is not thought to be practical to plug a line larger than 16 in. with this mixture, as the amount of bentonite required varies with the cube of the pipe diameter. It is found that it takes less bentonite to plug the line if it is introduced through the end of the pipe than if pumped through a service, especially if the gas is burning. The above figures are for introduction through a service. When the bentonite is put through a flame, the heat tends to evaporate part of the water, thus increasing the strength of the gel while the pipe through which the gel is being pumped also helps to hold the plug in place. It has been found that temperature has little effect on the strength of the gel.

After the flow is started in a bentonite gel, the material acts somewhat like a viscous liquid, obeying the equation:

$$Q = \frac{3.14.6\ D^4}{128\ M\ L}\left(P_2 - \frac{4}{3}P_1 + \frac{P_1^4}{3P_2^3}\right)$$

Where Q represents the rate of flow,
M = viscosity
P_2 = pressure causing flow
P_1 = pressure necessary to start flow as given before.
The viscosity of a 16% gel is about

$$0.05\ \frac{\text{(lb.) (Sec.)}}{\text{(Sq. Ft.)}}$$

It was found possible to pump 10 to 15 lbs. per min. of bentonite through a 1¼-in. service pipe 63 ft. in length, when using the air gun, about 250 lbs. pressure being developed. It is important when pumping the bentonite from the drums to use a following plate to force the bentonite into the pump. Some trouble has been experienced due to freezing of water from the air in the motor outlet. If the gas main is inclined downward with the gas stream, it will take more bentonite to plug it, the effect being greater the larger the diameter of the pipe and the more the slope. The bentonite used in this work is a Wyoming 25-28 bentonite.

In the foregoing explanation of the use of bentonite gel for plugging low pressure gas mains, it was assumed that either the end of the main was covered with debris and hence inaccessible, or else that it was only possible to insert a small pipe into the broken end of the main. If the circumstances are such that the broken end of the main is accessible and not badly fractured back from the break, the main may be plugged by other methods.

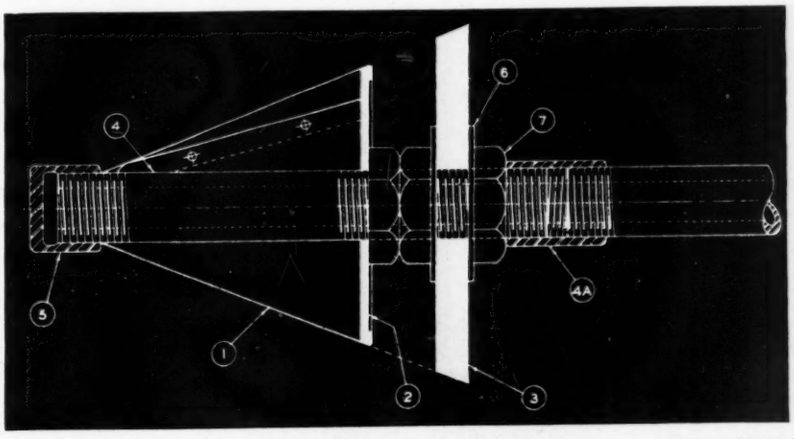
One method which proved practical was to use a canvas bag of the proper size for the main under consideration, and pump it full of bentonite to a pressure of about 4 lbs. per sq. in. in the bag. The bentonite gel is pumped into the bag through a ¾-in. pipe.

When the bag is introduced into the main it is tightly wrapped about the ¾-in. pipe and protected from the flame by a sleeve of 3-in. flue pipe. When the bag is in the proper location in the main, the sleeve is removed by means of a cable. (See Fig. 2.)

Fig. 3 shows the appearance of the bag in a 16-in. gas main when fully inflated with bentonite gel. The bag is removed from the main by squeezing part of the bentonite out through the opening in the end of the bag, after which the bag may be pulled out.

Under these conditions bentonite gel was thought to be superior to nitrogen or carbon dioxide as a means of inflating the bag, due to several considerations: the bentonite and the equipment for handling it were already at the spot and ready for use, whereas the use of an inert gas would require additional equipment; the heat of the flame is more likely to damage the bag when filled with nitrogen or carbon dioxide than when filled with bentonite; a more positive shut-off can be attained with bentonite; in case of damage to the bag, leaks, or breakage due to high pressure, the bentonite will still fill the main and shut off the gas. The chief reason for using a bag at all is only to decrease the quantity of bentonite required and the amount of time needed to plug the main. Once the main is plugged, the pipe from the pump to the bag can be removed if necessary, as there is no tendency for the bentonite gel to flow back through the pipe.

Another method of plugging the main is to use the mains plugger (Fig. 4). While this plug worked very well in small mains, it is not recommended for mains over 8 in. in diameter.



1. Cone guide.
2. End plate.
3. Rubber disk.
4. ½-in. connector.
4A. ½-in. socket.
5. ½-in. cap.
6. ⅞-in. washer. (In all sizes over 4-in. diam. a metal disk is substituted for this washer.)
7. ½-in. back nut.

FIG. 4. Mains plugger.

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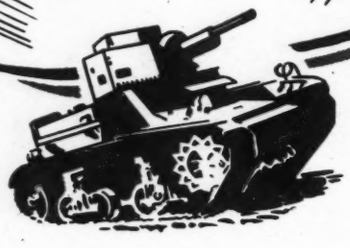
It is only through such a concept of duty by each company and each individual that we can assure ourselves of total victory.

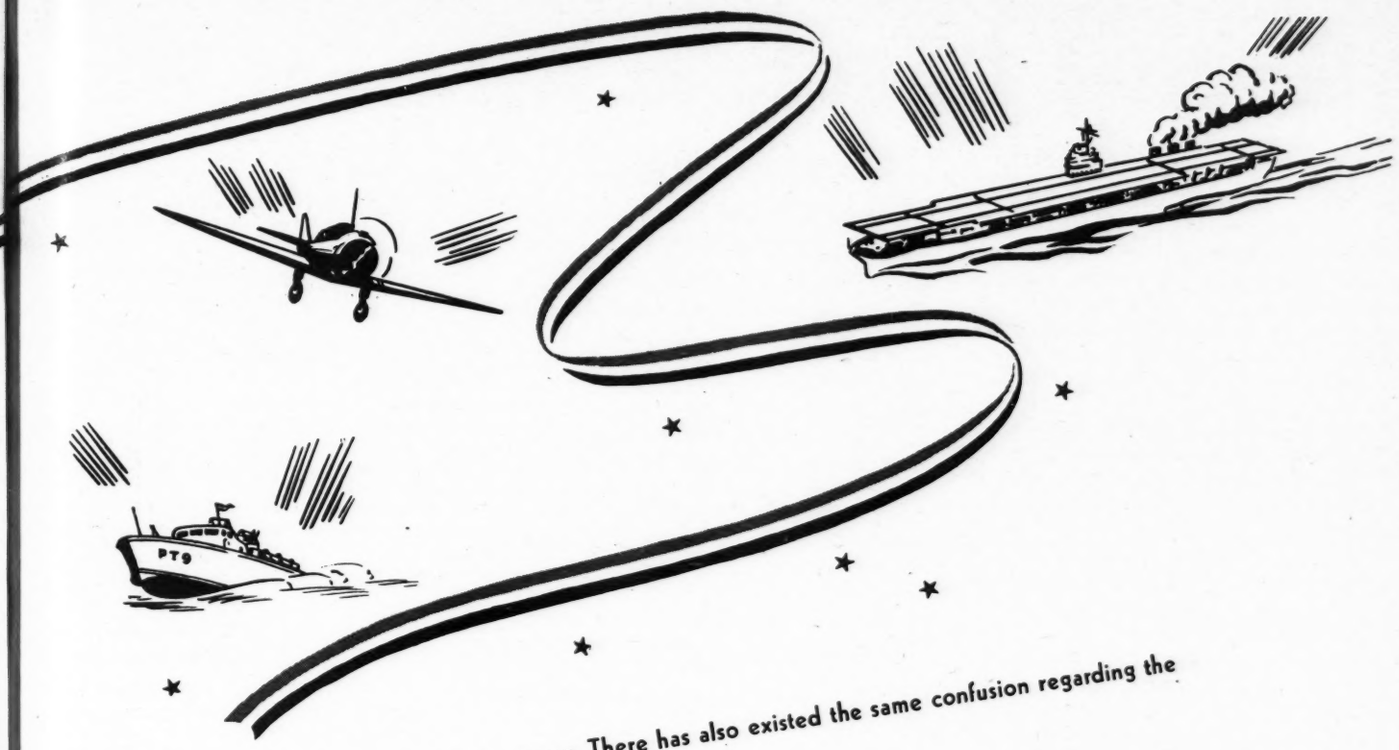
We do not believe that this policy merits any particular commendation because we hold it to be our simple duty and responsibility, and it is a good commentary on American Industry that thousands of companies, to the limit of their capabilities, have pursued a like course.

★ Cribben and Sexton Company has been and is an important factor in one of the relatively few industries which the United States Government has decreed to be essential to civilian welfare. It has been an axiom of military logic that an "army fights on its stomach", and it is universally recognized that a nation well and properly fed is better able to withstand the rigors, the sacrifices and the hardships of total war.

We believe, therefore, that the gas range dealer and the gas utility company in particular, have a responsibility in the intelligent distribution of available gas ranges to those consumers who are most in need of a new cooking appliance. The ability to properly prepare healthful cooked foods has been, and is the prerogative of the American Homemaker, and it is to help preserve this ability that various restrictions have been introduced by the government affecting the heretofore "free" sale of ranges. We concur in this plan and feel that as the final distributing agency, the gas range dealer can perform a vital public function by in turn excercising the proper care in selling ranges to the ultimate consumer.

There has naturally been some confusion in the minds of many gas range dealers concerning the sale





and delivery of ranges to the ultimate consumer. There has also existed the same confusion regarding the purchasing of ranges by the dealer from the manufacturer.

While there have, of necessity, been restrictions placed on the movement of ranges, there have been formulated procedures which permit the sale of ranges both to the dealer as well as to the ultimate consumer.

If any such confusion exists in your company as to these sales procedures, Cribben and Sexton Company will be glad to be of assistance in attempting to clarify for you questions of procedure relating to the sale of gas ranges.

The Amended Limitation Order L-79 issued by the War Production Board under date of May 23, 1942 has clarified the situation to a considerable extent, as it practically removes restrictions governing the sale and shipment of ranges by the manufacturer to the dealer, and also simplifies the sale and delivery of ranges by the dealer to the ultimate consumer.

★ ★ ★ We recognize the fact that our ability to assume a basic place in the war effort of our Country was to a great extent made possible by the position this Company occupied as a peacetime purveyor to the needs of the American public. We also recognize the fact that your loyalty as a Universal dealer is primarily responsible for that position. We in turn, in a spirit of cooperation, would welcome the opportunity to assist you to the best of our ability in solving any existing or future problems which may confront you pertaining to the sale and distribution of gas ranges.

CRIBBEN & SEXTON COMPANY

MANUFACTURERS OF UNIVERSAL GAS RANGES

700 NO. SACRAMENTO BLVD., CHICAGO, ILL.

Increased Capacity in Water Gas Sets

By R. J. HORN

Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y.*

WHERE increased capacity of water gas plants is important and construction materials are scarce, attention is naturally invited to possibilities of capacity increase in existing water gas generators. The inside diameter of the generator largely determines the capacity of the set, provided an ample supply of air is available and other facilities are adequate.

To increase the inside diameter of generators, thin silicon carbide linings have been used in some sets by the Central Hudson Gas & Electric Corp. since 1938. By this means, the area of the fuel bed section of generators formerly lined with clay has been increased with greater than proportionate increase in the capacity of the sets. Four generators on this property ranging in size from 7½-ft. to 11-ft., lined with thin walls, are giving complete satisfaction. An 8-ft. generator with thin-walled silicon carbide lining is giving a capacity of 112 Mc.f. per hour, which is 40% above the manufacturer's normal rating for this sized machine.

Thin linings are particularly applicable in standby plants and in sets operated for peak loads where additional marginal capacity is important. Under these conditions, the inside diameter may be increased 6 ins. or even more with silicon carbide inner face walls.

In some sets, the generator capacity resulting from thin walls may exceed the carburetting capacity of the set. Oil introduced into the generator will give additional total carburetting capacity and bring the generator capacity and the carburetting capacity of the set into balance.

Several types of walls have been used by Central Hudson as Figs. 1, 2, and 3 illustrate. In all types the inner face walls have been of silicon carbide. Insulating firebrick material of light weight and low thermal conductivity used behind silicon carbide in the wall construction minimizes the heat losses through the wall. Experience shows that the type of construction illustrated by Figs. 1 and 2 give no readily detectable increase in shell temperature over that prevailing with standard full thickness 12-in. linings.

The silicon carbide wall may be of standard circle brick or special shapes tongued and grooved both ways. With standard silicon carbide circle brick occupying 4½ in. of the wall thickness, all the reduction must be had in the other wall materials; whereas with only 2½ in. or 3 in. of the wall occupied with tongued and grooved silicon carbide blocks there is more possibility of increased generator cross section without risk of increasing the shell temperatures.

Water jackets are a possibility with walls which transmit too much heat. Fig. 3 shows the use of a water jacket on the generator shell. Chemically treated cold water is preheated in the jacket and piped to the boiler feed pump. A temperature rise of 50° F. in the jacket water was observed with this type of operation. To spill this water would be wasteful and if the heat in it cannot be utilized, this type of construction generally would be uneconomical.

Thin linings appear to have a life expectancy well beyond that necessary to justify their cost. One generator with 2½-in. thick silicon carbide has had 1740 operating hours and has been on standby service with an active fire for an additional 2000 hours. The face of these blocks show little erosion and there is no evidence of clinker adhesion having torn away any of the wall. Thin walls in intermittent use at a standby plant have been in service for over four years, with the apparent result that not over 20% or 25% of the life of the lining has been spent.

There are sufficient advantages in thin-walled generator linings to justify its careful study where greater capacity is urgent. Experience has proved the practicability of this type of lining.

*Presented before A. G. A. Joint Production and Chemical Committee conference in New York City, May 25 and 26, 1942.

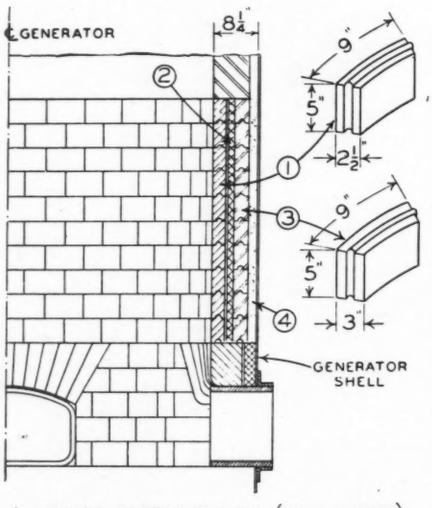


FIG. 1. Tongued and grooved silicon carbide blocks used with tongued and grooved clay bricks and insulating fire brick splits in thin wall of water gas generator.

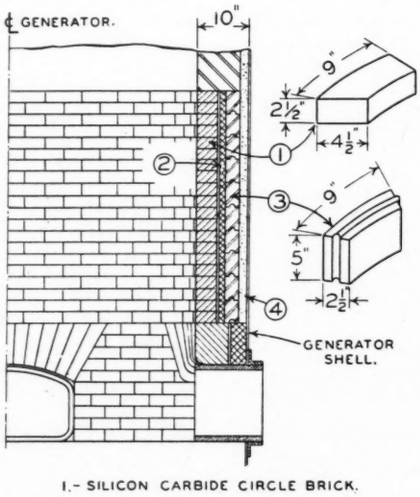


FIG. 2. Standard silicon carbide blocks used with tongued and grooved clay bricks and insulating firebrick splits in thin wall of water gas generator.

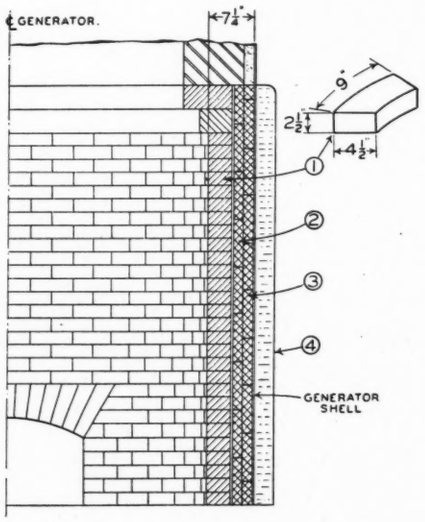
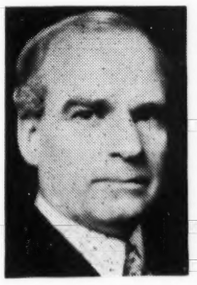


FIG. 3. Standard silicon carbide brick used with insulating firebrick splits and water jacket in thin wall of water gas generator to reduce heat transmission.

Recovery of Natural Gas From Coal

By LEO RANNEY

Technical Consultant, Ranney Water Collector Corp., Columbus, Ohio*



OF PARTICULAR interest to the gas industry is the latest work of Mr. Ranney in degassifying coal. He has been in charge of this type of work in Australia, where the first installation is now functioning, the gas being used in bags to drive automobiles and trucks in one of the largest cities. Production in the Australian plant is expected to exceed 300,000 cu. ft. daily, the equivalent of more than 20,000 gals. daily of 100-octane gasoline. Later, part of this production is to be used in enriching manufactured gas at a saving of 2,000,000 gals. of imported gas-oil annually. Mr. Ranney is also well known for his development of the horizontal-well method of drilling water wells. An application of this method to oil well drilling is now being installed at Franklin, Pa., to produce Pennsylvania grade crude oil.

Mr. Ranney received his education at Iowa State Teachers College and Northwestern University and after a brief interlude as a school teacher and superintendent of schools he became active in his chosen field as a construction engineer in 1912, developing in the course of the years many new ways of recovering oil from depleted fields, for the commercial recovery of natural gas from coal seams in advance of mining operations and from unused mine workings, for building underground dams without open trenches by replacement methods, for employing the air lift for drilling, shaft sinking, excavating, and recovering placer gold, for conserving water by charging flood water into the earth, for producing ground water, for the gassification of coal in place, and for the formation of underground storage reservoirs.—Editor.

THE American people have been and are a wasteful people. In the old days the oil fields were drilled only for oil. When gas was found it brought only curses from the driller. So gas wells were allowed to "flow open" for weeks and months on end, in the hope that they would "blow into oil'—which they often did. After a billion dollars' worth of this valuable fuel had been wasted, some dreamer got the idea that the gas might be saved. Now hardly a cubic foot of gas is allowed to waste from an oil well.

But today approximately 500 million cu. ft. of natural gas is being wasted every 24 hours from our coal mines, mostly in the East where it is badly needed. This natural gas is methane, deadly firedamp of the coal mines, with a heat value of 1000 B. t. u. per cu. ft.

Some of the coal seams of Ohio, West Virginia and Pennsylvania contain from 800 to 2000 cu. ft. of methane per ton of coal in place. This gas is slowly exuded into the mine workings from the coal face. Some of our mines produce as much as 6,000,000 cu. ft. of methane per day, and the cost of ventilating such mines may exceed 10¢ per ton of coal mined. In one case 27 tons of air must be blown through the workings for each ton of coal produced.

During 1940 in the United States some 275 miners lost their lives in mine explosions. Because of just one mine explosion (from gas) in Ohio a few years ago, the Industrial Commission has paid to date well over a million dollars to the families of the men destroyed—and is still paying. This case is only one of dozens. Each year mine owners meet and spend days discussing better fans, better brattices, better methods of diluting the gas. But never a word about recovering the gas from coal in advance of mining operations. What would we think of the medical profession if their whole attention were absorbed in methods of treating disease — with not a thought given to removing the cause or killing the germ?

A careful study must lead to the conclusion that the greatest gas fields of the East exist in our coal deposits. In West Virginia a coal seam in one field contains upwards of two trillion cu. ft. of sorbed methane — 2000 cu. ft. per ton of coal in place, and 22,000,000 cu. ft. per acre. This free gas adds nothing to the value of the coal, because it never reaches the market. Fig. 1 shows a cloud of methane gas recovered from coal.

How can a ton of coal contain 2000 cu. ft. of gas? Certainly not in the crevices and pores. It is held in the coal itself by intermolecular sorption. But methane (the wildest hydrocarbon gas) and solid carbon are so far apart in the scale that the equilibrium in which the methane is held is most unstable. The two are hard to "mix." It has been found that the most practical method of upsetting this equilibrium and releasing the gas is by a reduction of pressure—the application of a partial vacuum to the coal. Some mines have been known to increase their exudation of firedamp by 1,000,000 cu. ft. a day because of such an insignificant thing as a low barometer.

The main problem then is to distribute a vacuum into the body of coal to pull the gas out, through porous streaks, seams, "bleeders" and fissures. Research has indicated that the average bituminous coal seam is as permeable as the average gas sand, and that a high vacuum will pull methane through 400 ft. of average coal.

The problem of distributing the vacuum has at last been solved by our ability to drill long horizontal holes—4000 to 5000 ft. long in coal—and to control the elevation of the hole at any depth, to follow the contour of the coal seam. Such holes may be drilled from mine workings out into virgin coal, the holes being a mile long and being spaced about 800 ft. apart. Each hole is cased at the mine and with 400 ft. of pipe, grouted in. A high vacuum is then applied to the accessible end of the casing, which transforms each hor-

FIG. 1. Methane gas recovered from coal —2,000,000 cu. ft. per day from one hole.

*Reprinted from *Engineering Experiment Station News*, Ohio State University, June, 1941.

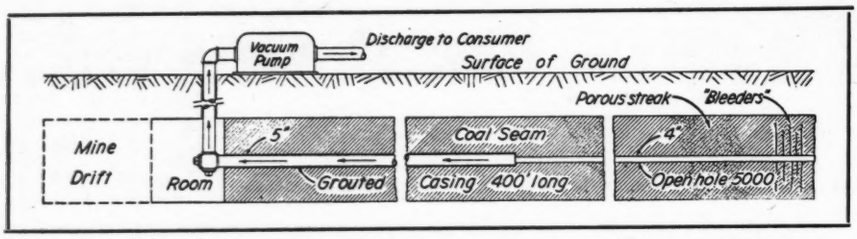


FIG. 2. Method of degasifying coal in place. Horizontal gas wells are drilled into virgin coal from mine workings. A high vacuum is pulled on the casing of each well to release the firedamp (natural gas). No free gas enters the workings.

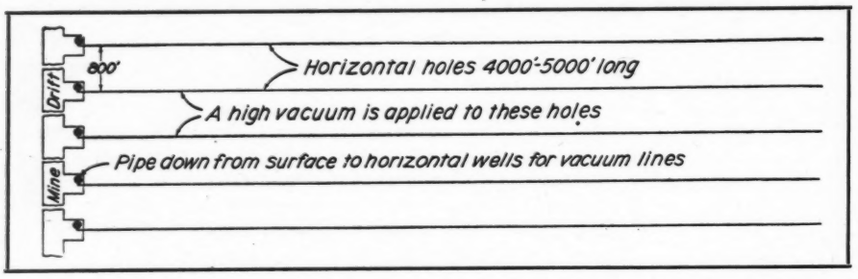

800'
Drift
Mine
Horizontal holes 4000'-5000' long
A high vacuum is applied to these holes
Pipe down from surface to horizontal wells for vacuum lines

FIG. 3. Spacing of horizontal gas wells in coal seams, plan view. These wells follow a predetermined course, or may be made to follow indulations in the bed. The method of drilling is the same as that used in drilling horizontal oil wells.

izontal hole into a large gas well. Fig. 2 shows the general layout, and Fig. 3 a plan view of the horizontal holes.

Neither during drilling or operating is any free gas allowed to enter the mine air. Drilling is done through stuffing boxes, and vertical holes from the surface down to the horizontal well casings contain pipes to conduct the gas vertically to the surface of the ground. The vacuum pump is on the surface.

If it is assumed that a partial vacuum will pull gas through 400 ft. of coal, on each side of a horizontal well, a block of coal 800 ft. wide is affected by each well—approximately two acres for each 100 ft. of well length. Then a well 4000 ft. long would drain gas from 80 acres. In some coal seams the influence of a vacuum would extend farther, in others not so far. But if this may be considered average, then in our most gaseous coal seams a maximum of 1,500,000,000 cu. ft. of gas would be drawn upon by each horizontal well.

No matter how desirable a humanitarian development may be, if it is an innovation that is to be widely adopted at once, it should also promise a profit to the coal operators. The overall cost of producing gas from these horizontal wells in a gassy seam is estimated at 5¢ or less per M c. f. The selling price would vary from 15¢ to 25¢ a thousand, depending upon who the customer is. A recovery of 50,000,000 cu. ft. should more than liquidate the cost of each well, and the operating cost from then on should be about 2½¢ per M c. f.

The percentage of recovery of this free methane by the application of a vacuum must vary with the free gas content, and the permeability and solidity of the coal. In recently exposed coal faces in going mines between 90% and 95% of the sorbed methane has vanished into the air of ventilation—without the application of a vacuum.

In ordinary mining and marketing operations the gas is gone long before the coal reaches the furnaces. So the removal of methane from coal in place has no effect on market values. In the average coal it may be assumed that a vacuum will recover from 75% to 90% of the sorbed gas. Then de-gasification becomes directly profitable.

The indirect profit to the operator lies in the elimination of occasional ventilating shafts, reduced ventilation costs in future mining operations, reduced compensation insurance rates, reduced taxes, a smaller number of damage suits (after a major disaster these often total over a million dollars) —all because by de-gasification the coal may be made at least partially non-gaseous.

Of far greater importance, to the householder, to industry and to the state, is the fact that the recovery of coal gas in advance of mining operations will release a new national asset of great value that was not known to exist—and will save the lives of thousands of miners during the years to come.

■ ■

Meters Added in Fort Worth

The total number of gas meter installations in Fort Worth during the first six months of 1942 was 41,768, an increase of 2,459 over the figures for the initial half of 1941. Fort Worth is served by the Lone Star Gas Co.

Gibson Field Pipe Line Completed Under Difficulties

MAIN line construction of the 19½-mi. 10-in. pipe line which will tie the natural gas resources of the Gibson field into the United Gas Pipe Line company system by means of the new Lirette-Mobile line was completed late in June following considerable bad weather and delayed delivery of important materials occasioned by wartime conditions.

Work started March 10 on the 19½ miles of pipe line which were laid through approximately 50% swamp and 50% cultivated land, and by March 20 eleven miles of pipe had been coated, 12 miles of right of way cleared, 9 mi. were weeded, 7 mi. laid and backfilled, 6 highway crossings were bored and cased and 3 canal and bayou crossings were completed.

By April 10 15 mi. of the total distance had been laid, but seven days later the problem of material shortage was encountered when the shipment of river weights was delayed.

While waiting for the weights to be molded, workmen completed all the highway and river crossings and blew and tested more than 10 mi. of the completed portion of the line.

The shipment of clamps was received June 5 and the line completed except for 2,900 ft. when heavy rains held up construction again. It was not until June 18 that the line was ready for the final testing.

The 10-in. O.D. pipe used in the construction of the new line is protected throughout by a coating of coal tar enamel and an outer wrapping of asbestos pipe line felt.

■ ■

Ohio Cities Intervene In Rate Investigation

The Federal Power Commission July 22 announced its orders permitting intervention of the Cities of Cleveland, Euclid, and Lakewood, Ohio, in the proceedings before the Commission on the application of the East Ohio Gas Co., Cleveland, Ohio, for a certificate of public convenience and necessity under section 7 (c) of the Natural Gas Act, as amended, for continued operation based on bona fide operation on February 7, 1942, or a finding by the Commission that East Ohio is not a natural gas company under the Act. The petitions for leave to intervene were filed by Cleveland and Euclid on June 25, 1942, and by Lakewood on June 29, 1942.

Each of the orders announced provides that "such permission shall not be construed as recognition by the Commission that said city might be aggrieved by any order of the Commission issued in this proceeding."

■ ■

P. G. & E. Requests Order To Close Surplus Gas Tariffs

Pacific Gas & Electric Co., San Francisco, under application 25139 to the California Railroad Commission, requests interim order to close surplus gas tariffs to (a) new applicants, (b) existing and former customers at new locations, (c) existing firm gas customers at present locations, (d) for additional equipment at any location with provision that commission may permit exceptions where found just and reasonable. Such emergency rule and regulation shall terminate six months after declaration of armistice. Application comes about because the utility's gas supply is now essentially coming from dry gas field and accordingly is not surplus.

FPC Refuses Rate Rehearing To Hope Natural Gas Co.

THE Federal Power Commission announced July 15 denial of a petition by the Hope Natural Gas Co., Pittsburgh, Pa., for rehearing and stay with respect to the Commission's opinion No. 76, findings as to the lawfulness of the company's past rates, and its order entered May 26 reducing the company's interstate rates for natural gas sold to Ohio and Pennsylvania distributors by $3,609,857 annually.

The Commission's order reduced Hope's rates for natural gas, effective as to all bills based on meter readings made on or after July 15 to The East Ohio Gas Co. (which serves Cleveland, Akron, Youngstown, Massillon, Canton and a number of other Ohio communities) from 36.5¢ to 29.5¢ per M c.f.; to the Peoples Natural Gas Co (which serves Pittsburgh, Altoona, New Kennington, and other Pennsylvania communities) from 35.5c to 28.5c per M c.f.; and to the Manufacturers Light & Heat Co. (which serves New Castle, Washington and other Pennsylvania communities), and Fayette County Gas Co. (which serves Uniontown, Connellsville, and a number of smaller Pennsylvania communities) from 31.5c to 28.5c per M c.f.

■ ■

Natural Gas Act Amended By FPC Order No. 94

Several amendments to the Natural Gas Act effective July 11, 1938, became effective on July 15, 1942 under Federal Power Commission Order No. 94.

Newly established rates or charges for the sale or transportation of natural gas not theretofore in effect must be filed with the FPC not less than 10 days prior to the date on which such rates or charges are to become effective. Information FPC wishes filed is the date on which service under the new contracts is proposed to be initiated, an estimate of sales and revenues by months for the first 12 months of service, and a comparison of the new rate with other rates of the company for similar service.

Also rescinded is Order No. 65, dated October 17, 1939, directing that natural gas companies report semi-annually on Form No. 141 regarding transportation and sale of natural gas in interstate commerce.

■ ■

Texas Commission Modifies Recycling Regulatory Order

The Texas Railroad Commission in July amended an order of May 19 relative to meters in recycling plants, eliminating the necessity for operators to install a meter to measure the gas injected back into the producing horizon. All other meters called for in the original order must be installed. Elimination of the injection meter was done after it had been found that it is now impossible, due to war priorities, to obtain the high pressure meter necessary to measure the flow. The order became effective August 1.

■ ■

Helium Production Expanded

Millions of additional cubic feet of lightweight helium will flow from the recently enlarged helium plant operated by the Bureau of Mines, according to Dr. R. R. Sayers, Director of the Bureau. This helium will be processed from gas produced from Government wells now in operation in Texas. In addition, a new helium production plant at an unannounced location will be supplied with helium-bearing natural gas from an existing pipe line transporting gas for fuel markets.

Contracts Awarded on Oil Pipe Line

THE pipe for the emergency 550-mi. pipe line from the East Texas oil field to Illinois, designed to provide partial relief of the East Coast supply situation by next Christmas, started coming from the mill July 1, it has been announced by Petroleum Coordinator for War Harold L. Ickes.

Drawing of the 24-in. tubing is being done by the National Tube Co., Pittsburgh, Pa. National Tube has been authorized to draw 137,500 tons of tube altogether, which is the equivalent of 550 mi.

Actual laying of the pipe along the route now being staked out from Texas across Arkansas and Missouri into southern Illinois is scheduled to begin some time this month.

Contracts were awarded on a cost-plus-fixed-fee basis, according to information furnished the Coordinator's office by B. E. Hull, general manager of War Emergency Pipeline, Inc., the company organized by the oil industry to plan and supervise the building of the line for the government. Hull said the fixed fees agreed upon vary as between contractors but average about $1000 a mile of pipe to be laid.

Total cost of the line, which is being financed by the government through the Defense Plant Corporation, is estimated at $35,000,000.

Each contractor will build a single section of the line, as follows:

1. Section from Longview to the Arkansas-Texas line, Williams Bros., Tulsa, Okla.

2. Section from the Arkansas-Texas line to Gurdon, Ark., O. E. Dempsey Construction Co., Tulsa, Okla.

3. Section from Gurdon, Ark., to Little Rock, Ark., Anderson Bros., Tulsa, Okla.

4. Section from Little Rock to the Missouri-Arkansas line, Oklahoma Contracting Co., Dallas, Texas.

5. Section from the Missouri line to Illmo, Mo., C. S. Foreman Co., Kansas City, Mo.

6. Section from Illmo to Harrisburg, Ill., Ray E. Smith Construction Co., Eldorada, Kan.

7. Section from Harrisburg to Norris City, Ill., Sherman Pipe Line Construction Co., Tulsa, Okla.

Sherman also was awarded contract for construction of the 14-in. line from Norris City to Mount Vernon, Ind., and for the 10-in. line from Norris City to Enfield, Ill.

Contracts for the construction of eight river crossings were awarded to Williams Bros. The line will cross the Red, Little Missouri, Quachita, Arkansas, Cache, White, St. Francis and Mississippi rivers, the latter at a point just below Cape Girardeau.

Gas Water Heater War Standards Available

ANTICIPATING restriction of future gas water heater production to those designed to conserve strategic materials, American War Standard Approval Requirements for Gas Water Heaters, Z21.10 WS-1942, have been adopted by the American Standards Association. Sponsored by the American Gas Association, they were prepared and approved under the special procedure established for prompt development of war emergency standards. They will be in effect for duration of the emergency.

Revisions incorporated in these war standards cover mainly construction features. They are streamlined as far as possible consistent with safety and reasonable durability. No changes are made in any performance provisions, with the exception of one minor detail applying to storage vessels of assembled units. All safety and efficiency features are retained. In view of their modified construction, as compared with peacetime models, "utility" water heaters complying with provisions of the new standards must display the following inscription in addition to the Laboratories Approval Seal: *Approved Under War Emergency Requirements.*

In addition to these war standards, three sets of new and revised gas equipment requirements were adopted as American Standard on June 5, 1942. These include new requirements for installation of gas-burning equipment in power boilers and revised editions of approval and listing standards respectively for gas refrigerators and gas valves. In view of the greatly increased use of gas for wartime industrial processes, adoption of a nationally acceptable installation guide for gas-burning equipment in power boilers is particularly significant. Construction and performance requirements for manual main gas control, pilot adjustment, pilot shut-off and gas burner valves deserve special mention.

Additional information and copies of these requirements may be obtained from the American Gas Association Testing Laboratories, Cleveland, Ohio, and Los Angeles, Calif.

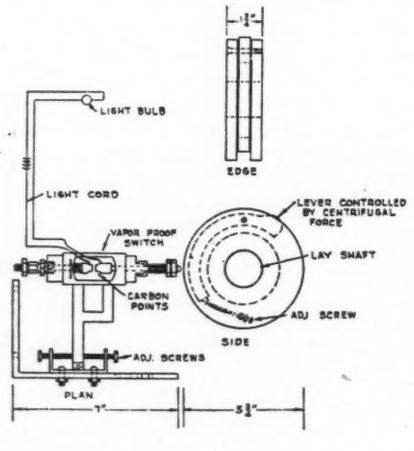
NU-WAYS

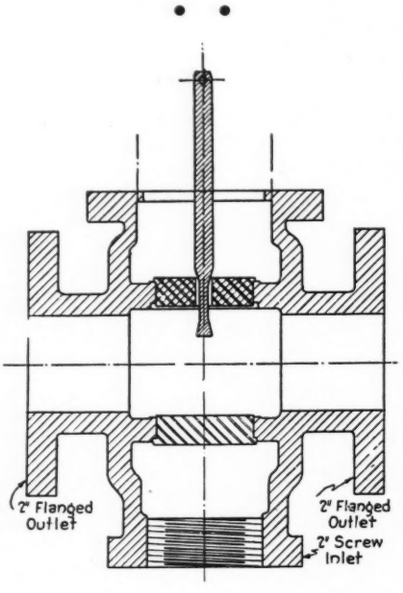
Gas Engine Speed Indicator

Graydon Gower, Chief Engineer, and C. F. Turbeville, Repairman, Phillips Petroleum Co., Oklahoma City, Okla. Submitted in Operating Kinks Contest, Natural Gasoline Association of America, Tulsa, Okla.

An accurate and positive underspeed indicator has been devised to facilitate the maintenance of the rated horsepower required for the desired gas delivery of a unit. Such a device would be especially useful in a plant having varying loads. This underspeed indicator functions by causing a light to flash by means of a device utilizing centrifugal force. A wheel, fitted to the lay shaft, is equipped with a lever which hugs a grooved wheel when the engine is operating at the prescribed speed. But when the engine slows down, the short end of the lever attachment emerges from the grooved wheel and contacts the point extension of a vapor-proof switch. When points in the switch contact (each time the lever swings out), the light is illuminated and flickers.

The vapor-proof switch is constructed from a sight feed lubricator chart; it has very sensitive carbon points. Fabrication of the stand for the switch is such that adjustment by set screws is possible. Spring tension on the lever can also be varied by an adjusting screw. The value of this device is readily seen by analyzing a situation which is commonly found. Where an average of 200 r.p.m. is desired but where the speed drops to 190 r.p.m., the compressor will pass about 5% less gas. If such a drop occurs in an engine room with more than 20 engines of 230 hp. of this type, one potential engine of 230 hp. is lost in so far as effective gas delivery is concerned. It is difficult to tell when an engine loses a few revolutions by just looking at it. This device can be modified to serve as a combination underspeed and overspeed indicator. To do this, it is only necessary to make a contact protuberance on the opposite end of the lever wheel. Advantages of speed control justify installation of this device.

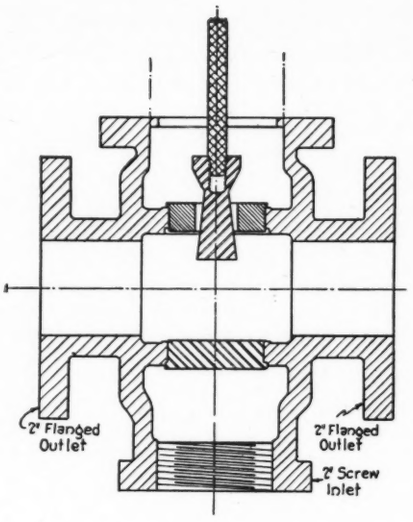




Governor Valve Improvement

J. G. Williams, Chief Engineer, Phillips Petroleum Co., Oklahoma City, Okla. Submitted in Operating Kinks Contest, Natural Gasoline Association of America, Tulsa, Okla.

This improvement is directed toward the elimination of chances for having a runaway engine, prevention of backfiring, and maintenance of perfect safety control, easy starting, and automatic engine shutdown in case of governor failure. The improved valve acts as a gas control, moving up or down, while the old valve moved downward only. The new valve has friction only in the packing nut, while the old valve had friction in the top and bottom seat and packing nut; this gives greater sensitiveness to the new valve. A bottom plug, attached to the stem, floats in the opening of the governor body, causing the fuel to travel to the valve seat, thus letting the valve float at all times without friction. If something happens to the governor which causes the shaft, or valve stem, to rise, the bottom valve will close off or nearly close off the gas and shut down the engine. The advantage of this feature is obvious, for with the standard governor without the bottom attachment or seat, at a time of governor failure, the engine would run away when the valve shaft rises. The ranger wheel makes it possible to set the valve in any desired position while starting the engine. The estimated cost of material and labor (shop) on the new valve and seats is $1.50 per unit.

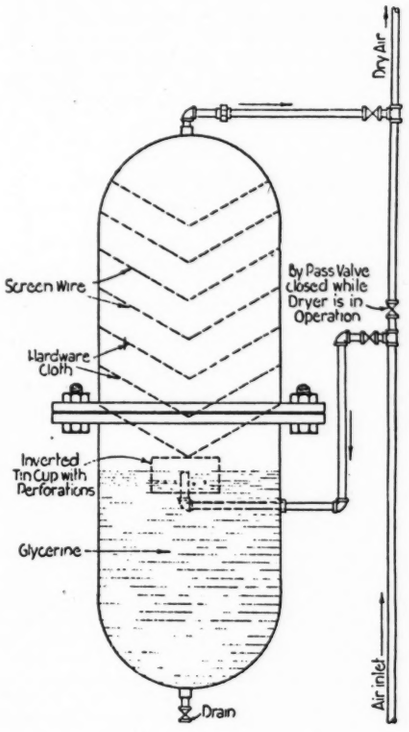


Air Dryer

H. E. Chambers, Chief Operator, Skelly Oil Co., Lyman, Okla. Submitted in Operating Kinks Contest, Natural Gasoline Association of America, Tulsa, Okla.

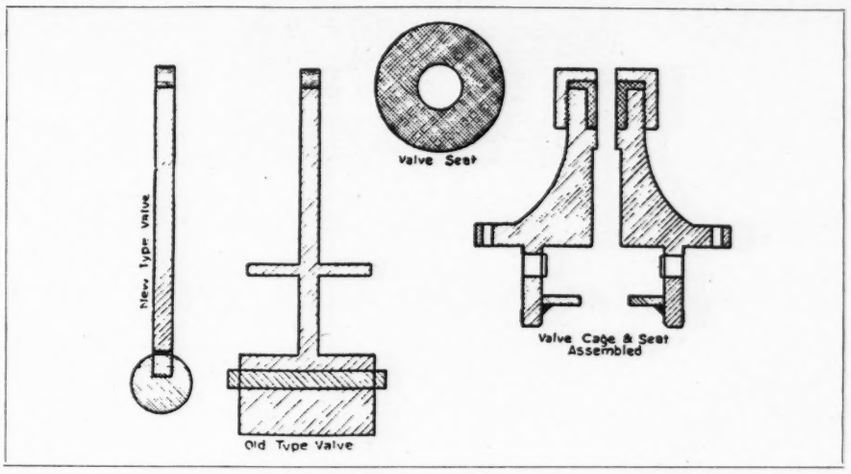
Interruptions due to freezing of moisture in air lines of control equipment have been eliminated by the use of this air dryer. Considerable trouble had been experienced in freezing weather when the shutting off of a control valve upset operations. A dryer was installed which removed moisture from air by the use of glycerin. Air coming from the dryer is so dry that no moisture collects in the drips at the controls. During the past winter, where the dryer was used, there was no freezing in the control air lines. The air dryer was installed in the open without protection. Even in zero weather it functioned satisfactorily; glycerin did not thicken excessively; and there was no trouble either with the operation of the dryer or with the air going to the controls.

The air dryer was installed on a set of controls using 300 ft. of air per day. There is a frost box around the line from the point where it comes out of the ground to the point where it enters the dryer. The dryer was made of material available in warehouse stock; two 6-in. bull plugs were flanged together; a ½-in. collar was welded in the side of the lower plug for an inlet; a ½-in. collar was welded in the top of the upper plug for an outlet. These were connected with the air line and equipped with shut-off valves and a by-pass with a valve. A nipple turned up at the end is connected with the inlet collar; a tin drinking cup (with perforations in the side near the open end) is inverted over it for a bubble cap. A quart and a half of glycerin just covered the perforation. Layers of



hardware cloth and screen were spaced from the top of the dryer to prevent carry over of glycerin. On inspection after use, it was seen that the top layers of screen had no trace of glycerin on them.

Six weeks after putting this device in operation the glycerin solution measured more than the original amount used. This was distilled in a liter engler distillation flask until the temperature of distilled vapors rose to 300° F.; 95% of the volume of the original glycerin was put back in the dryer and used the rest of the winter.



Governor for Gas Engine

B. F. Gilstrap, Chief Engineer, J. E. Crosbie, Inc., St. Louis, Okla. Submitted in Operating Kinks Contest, Natural Gasoline Association of America, Tulsa, Okla.

This valve has been used for eight months at the St. Louis, Okla., plant, where it has functioned satisfactorily without requiring any attention except for that required in oiling. This valve was designed to prevent sticking. In making the valve, a common ⅝-in. washer was brazed in the casing of the valve cage. The valve was made by using a broken ⅜-in. operating rod with ¾-in. ball which had been formerly used in the governor. To give larger space for the rod to turn in, the shaft of the valve cage was counterbored to 7/16 in. diameter. The valve does not turn as fast as the governor; there has been no wear on the stem packing causing leakage. The total cost of having this valve made at a machine shop should be between $2 and $3.

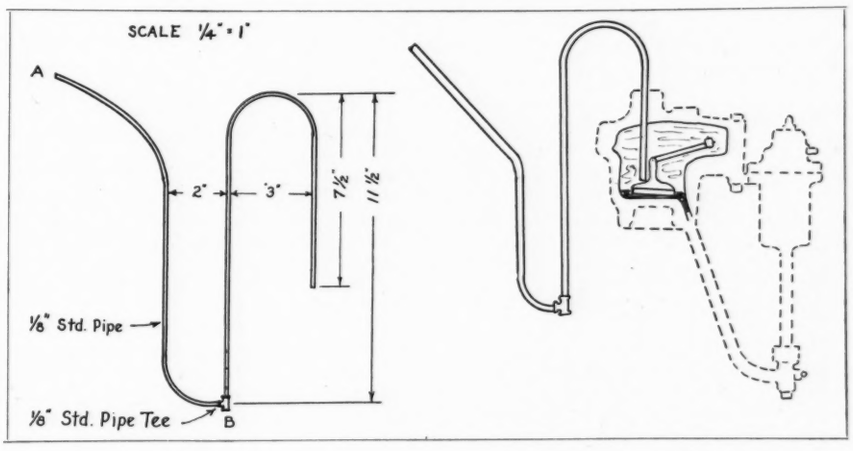
Removing Liquid From Meter

Richard W. Weeks, Phillips Petroleum Co., Phillips, Texas. This wrinkle was presented at the Southwestern Gas Measurement Short Course at Norman, Okla., April 21-23.

This method is useful when adding anti-freeze to steam meter, in resealing liquid meters, or in servicing gas meters that measure a very wet gas.

First, take the meter out of service. Drain or blow the connecting lines and manifold. Pull mercury fill plug and insert the "wrinkle" as shown. Place one of your fingers over point B (bottom of the ⅛-in. tee) and allow a small amount of air to enter the pipe as you remove the air from the pipe with your mouth at point A. (Caution—Do not stop up the ⅛-in. tee connection with your finger.) The liquid will start leaving the chamber immediately. When the liquid comes into contact with your finger, remove the finger. The liquid within the chamber will continue to flow until empty. The "wrinkle" is in contact with the float and the mercury is not affected. The very small amount of liquid left will not give any trouble. The high side chamber can be drained by removing the ¼-in. plug.

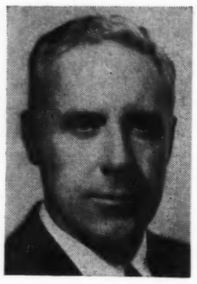
The use of the "wrinkle" prevents removing the low side chamber head or draining the mercury, changing the dampening of the meter, and in the case of rate of flow controller, reduces "hand control" time.



ASSOCIATIONS

Bridge Nominated for A.G.A. Presidency

ARTHUR F. BRIDGE, vice president and general manager, Southern Counties Gas Co., Los Angeles, Calif., has been nominated to direct the activities of the American Gas Association next year, according to the recent announcement of the nominating committee which has presented a full slate of Association officers for consideration of the membership prior to the annual meeting in the fall. Those also nominated for various other positions are:



E. R. Acker

A. F. Bridge

For vice president—Ernest R. Acker, president, Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y.

For treasurer—J. E. Llewellyn, insurance manager, The Brooklyn Union Gas Co., Brooklyn, N. Y.

For directors, two-year terms—John W. Batten, vice president and general manager, Michigan Consolidated Gas Co., Detroit, Mich.; James A. Brown, engineer in charge of gas operations, Commonwealth & Southern Corp., New York, N. Y.; D. W. Harris, vice president and general manager, Arkansas Louisiana Gas Co., Shreveport, La.; H. N. Mallon, president, Dresser Manufacturing Co., Bradford, Pa.; Hudson W. Reed, president, The Philadelphia Gas Works Co., Philadelphia, Pa.; W. F. Rockwell, president, Pittsburgh Equitable Meter Co., Pittsburgh, Pa.; Herman Russell, president, Rochester Gas & Electric Corp., Rochester, N. Y.; Marcy L. Sperry, president, Washington Gas Light Co., Washington, D. C.; T. J. Strickler, vice president and general manager, Kansas City Gas Co., Kansas City, Mo.; P. S. Young, chairman, executive committee, Public Service Electric & Gas Co., Newark, N. J.; R. G. Barnett, vice president and general manager, Portland Gas & Coke Co., Portland, Ore.

The following have been nominated by section nominating committees to serve as section officers for the next Association year:

Accounting Section—For chairman, L. A. Mayo, Connecticut Light & Power Co., Hartford, Conn.; for vice chairman, O. H. Ritenour, Washington Gas Light Co., Washington, D. C.

Industrial and Commercial Gas Section—For chairman, B. H. Gardner, Columbia Gas & Electric Corp., Columbus, Ohio; for vice chairman, Charles G. Young, Springfield Gas Light Co., Springfield, Mass.

Manufacturers' Section—For chairman, John A. Robertshaw, Robertshaw Thermostat Co., Youngwood, Pa.

Natural Gas Section—For chairman, Burt R. Bay, Northern Natural Gas Co., Omaha, Neb.; for vice chairman, R. E. Wertz, Amarillo Gas Co., Amarillo, Texas.

Publicity and Advertising—For chairman, Charles A. Tattersall, Niagara-Hudson Power Corp., New York, N. Y.

Residential Section—For chairman, B. A. Seiple, Jersey Central Power & Light Co., Asbury Park, N. J.; for vice chairman, C. V. Sorenson, Midland Utilities Co., Hammond, Ind.

Technical Section—For chairman, John H. Wolfe, Consolidated Gas, Electric Light & Power Co., Baltimore, Md.; for vice chairman, Charles F. Turner, East Ohio Gas Co., Cleveland, Ohio.

The general nominating committee was composed of Paul R. Taylor, chairman, vice president, Consolidated Gas & Electric Co., New York, N. Y.; B. C. Adams, president, The Gas Service Co., Kansas City, Mo.; R. E. Fisher, vice president, Pacific Gas & Electric Co., San Francisco, Calif.; Chester L. May, president, Community Natural Gas Co., Dallas, Texas; James L. Stone, president, Danbury & Bethel Electric Light Co., Danbury, Conn.; Alan P. Tappan, vice president, Tappan Stove Co., Mansfield, Ohio.

■ ■

Name New Dates, Location for National Chemical Exhibit

The Chicago Section of the American Chemical Society has announced a change in dates and location for its second National Chemical Exposition, owing to the acquisition of the Stevens Hotel in Chicago by the United States Army.

The exposition and conference have been transferred to the Sherman Hotel, conveniently located in Chicago' business center at Clark and Randolph Streets, and will take place from November 24 to 29 instead of a week earlier as originally planned.

Wisconsin Utilities Ass'n Maps Technical Work

RESEARCH topics were selected for the different committees of the Technical Division of the Gas Section of the Wisconsin Utilities Association at the first conference of Advisors and Committee chairmen under a new set-up instituted by E. C. Hemes, Division Chairman.

R. A. DeMint, chairman of the Meter and Regulator committee, reports that the committee determined upon the following subjects for study: Solder recovery, with E. C. Hemes as leader; Theory and Practice of proper meter repair and adjustment, with R. Schmidt as leader; large meter changes on mileage basis, with J. H. Mikula as leader; standardization of meter design, with G. A. Anderson as leader.

Deane True, chairman of the Distribution committee, reported that the following subjects were selected for study. Benefits of wrapping steel pipe, leak location, service connections at mains, main conditioning, results of using furfural on gummy deposits, emergency repair methods, reconditioning steel pipe. Topics will be assigned to committee members and they will be expected to report at a conference in the fall.

Paul A. Hoffman, chairman of the Customer Service Committee, advised that his committee will study and report on the following topics: Reducing Customer premises calls, one-trip calls, elimination of call backs, charges for service calls.

■ ■

War Topics Discussed at Southern California Meeting

Meeting for the first time under the gavel of W. Lawrence Cowan, Union Oil Co., Los Angeles, Calif., and new president of the organization, the Southern California Meter Association dinner gathering in July heard W. W. Robinson, chief chemist, Texas Co., discuss the "Practical Side of Synthetic Rubber", and James E. Daly, special agent, F. B. I., explain the operation of the "F. B. I. in National Defense."

■ ■

Indiana Gas Association Elects New Officers

C. V. Sorenson, Northern Indiana Public Service Co., Hammond, Ind., has been elected president of the Indiana Gas Association. Guy T. Henry, Central Indiana Gas Co., Muncie, was named vice president and Paul A. McLeod, Public Service Co. of Indiana, Inc., Newcastle, was selected for secretary-treasurer. Mr. Sorenson is also chairman of the Refrigeration Committee of the American Gas Association.

■ ■

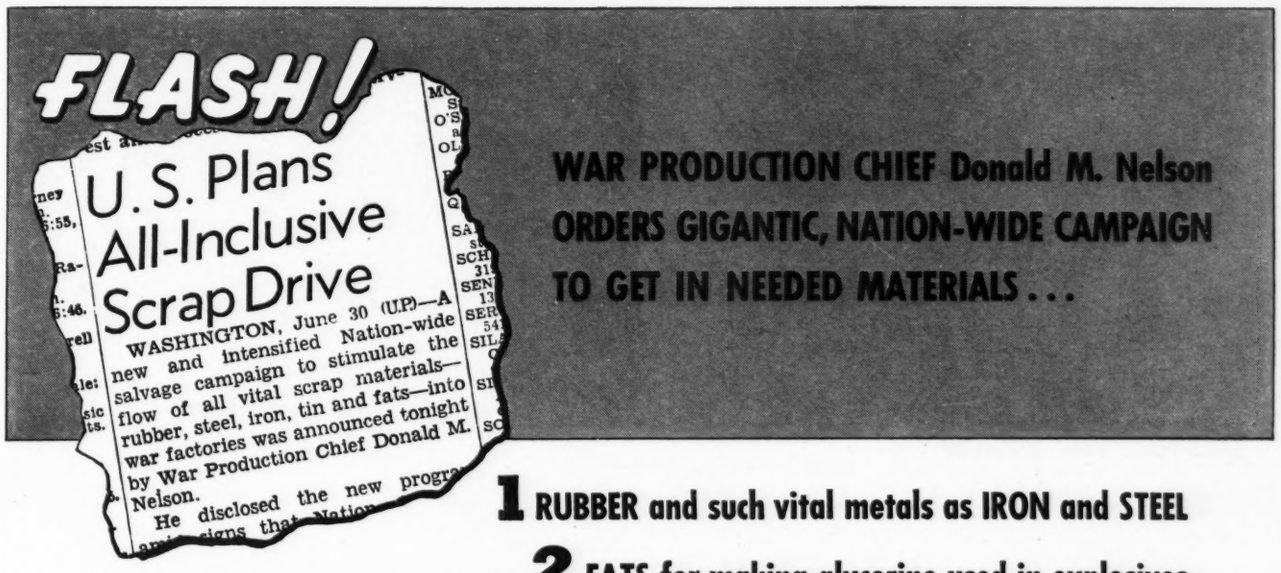
Wisconsin Utilities Gas Men Organize for War Emergency

The Technical Division of the Gas Section, Wisconsin Utilities Association, has been mobilized to provide for prompt and efficient war emergency services to companies and their personnel by E. C. Hemmes, chairman of the division. The first committee of the division to hold a session was the Meter and Regulator committee which held a conference on June 19.

■ ■

San Francisco Gas Sales High

Sales of commercial and industrial gas in San Francisco, Calif., attained a new all-time high during the month of April, when 828,617,400 cu. ft. were consumed.


FLASH!
U. S. Plans All-Inclusive Scrap Drive
WASHINGTON, June 30 (U.P.)—A new and intensified Nation-wide salvage campaign to stimulate the flow of all vital scrap materials—rubber, steel, iron, tin and fats—into war factories was announced tonight by War Production Chief Donald M. Nelson.
He disclosed the new progra
WAR PRODUCTION CHIEF Donald M. Nelson ORDERS GIGANTIC, NATION-WIDE CAMPAIGN TO GET IN NEEDED MATERIALS . . .

1 RUBBER and such vital metals as IRON and STEEL

2 FATS for making glycerine used in explosives

3 TIN CANS (in certain designated cities)

EVERY TYPE OF BUSINESS, every home, every farm and factory in the country is expected to take part in this vast mobilization to get in the scrap.

"Scrap", says Donald Nelson, "is a vital part of our raw material supply on which our entire war production depends". One ton of scrap *steel,* for example, is equivalent to five tons of raw material...two of iron, two of coal and one of limestone. Obviously we can solve our raw material problem faster . . . and at the same time save shipping, smelting and other production steps . . . if we hurry . . . *now* . . . to get in the scrap!

Consult the Salvage for Victory Committee in your community or write the WPB General Salvage Committee, 1355 Market Street, San Francisco.

DO YOUR PART! *DURATION-IZE YOUR GOOD MACHINERY . . . GET IN THE SCRAP!*

Fifth in a series of advertisements being published by the Pacific Gas and Electric Company aimed at getting in the farm and rural scrap

P·G·and·E·
PACIFIC GAS AND ELECTRIC COMPANY

You can give it *Wings!*

HAVE YOU REALIZED that old jallopy of yours has *another* life to give to its country? down and made into part of a plane, it might even go with General Tokio? Decide *now* that you will do your bit to relieve

prices which you

You can help to pack

MORE SHIPS, TANKS AND PLANES

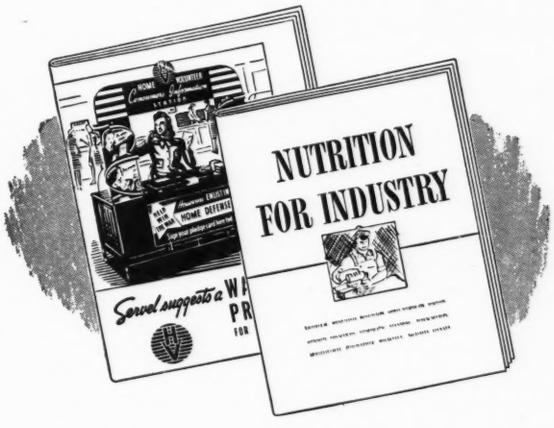
into America's lunchbox

Eating the right foods *on the job* is equally as important as eating properly at home. The Gas Industry, through its experience and facilities, is in a unique position to help guide the packing of America's lunchboxes. Servel's "Nutrition for Industry" Plan can help you do that job in your community.

A NUTRITION PLAN FOR WAR INDUSTRIES

This extension of Servel's H-V Program presents another important way in which Gas Companies may serve their country and their communities.

LOYALLY and energetically, Gas Companies everywhere, in cooperation with the government's National Nutrition Program, have shouldered the task of helping to bring to the housewives of America experienced advice and practical information on "Foods That Keep Us Fit."



Now our government is urgently directing attention to another vital phase of this nutrition work. Because increased production demands greater physical fitness and less lost time, it's tremendously important that war workers eat the right foods—not only at home, but also *on the job!*

To meet this need Servel has developed, in collaboration with government Industrial Nutrition officials, a simple, easily applied program to assist in the "all out" war production drive. Servel started this program months ago—in its own war plant, for its own war workers. Now, the procedure has been so simplified that any Gas Company can easily start a similar program in the war plants in its communities.

The many Gas Companies now sponsoring Servel's Home Volunteer Program will readily see how the "Nutrition for Industry" Plan can become an important extension of that activity. However, even if a local H-V Program has not yet been arranged, the potential good-will any Gas Company can develop with the "Nutrition for Industry" Program will be immediately apparent.

A portfolio outlining the plan will be available shortly. By writing to Servel, Inc., Sales Promotion Department, Evansville, Indiana, you will be assured of being among the first to receive the details.

SERVEL, *Inc.*

MANUFACTURER OF THE SERVEL GAS REFRIGERATOR

WINS GOOD WILL FOR GAS AND GAS SERVICE

Oil Compact Committee Quarterly Meeting

NATURAL gas will play a heavily increased part in the production of oil if plans for stepping up secondary recovery, adopted by the Interstate Oil Compact Commission at its summer quarterly meeting at Lexington, Ky., June 19 and 20, are carried out as recommended.

The compact commission adopted a report of its research and coordinating committee, Dan O. Howard of Oklahoma, vice chairman, recommending legislation providing for maximum application of secondary recovery operations, repressuring, pressure maintenance, recycling and cycling with protection from state and federal anti-trust acts.

The legal committee, Earl Foster, Oklahoma City, reported, suggesting that each oil producing state pass an adequate law specifically authorizing agreements with respect to secondary recovery operations. The committee also suggested that it may be advisable for the Congress of the United States to pass a similar law to give broad power to an administrative agency to regulate such operations. The committee recommended adoption of the definitions of "secondary recovery," "repressuring," "pressure maintenance," "recycling" and "cycling" as they have been approved for publication in the forthcoming book of the American Petroleum Institute on "Secondary Recovery in the United States." All recommendations of the legal committee also were adopted at the meeting.

The compact commission's technical group recommended that the United States Bureau of Mines make a survey and study of secondary recovery operations in the Mid-Continent area.

Preliminary reports on the secondary recovery operations in several states were made by representatives of those states and by E. G. Dahlgren, Oklahoma City, technical secretary of the research and coordinating committee. Mr. Dahlgren is continuing those studies for a more complete report at the next quarterly meeting of the compact commission.

Information received by Mr. Dahlgren from California reveals that considerable gas injection was done in that state as early as 1929 and that there are now several projects in recycling and repressuring in the state.

No more than 10 of approximately 115 oil fields in the Rocky Mountain region of northern New Mexico, Colorado, Utah, Wyoming and Montana have adopted any secondary recovery methods. Nearly all of these have been by gas injection and for the primary purpose of conserving gas.

Texas has been extremely active in promoting secondary air and gas recovery, Mr. Dahlgren reported. Most of these activities are found in fairly shallow fields in north and central Texas and in certain parts of southwestern Texas. He further reported that Oklahoma has been an important experimental proving ground for secondary recovery. Application of these methods during the past 17 years to some 47 areas has recovered 56 million barrels of oil which would not have been recovered by so-called normal or primary methods. Secondary recovery accounts for approximately 31,000 barrels of the daily average production of the state.

Paul D. Torrey, consulting geologist and engineer, Houston, Texas, stated that at the start of this year secondary recovery operations affected 306,282 acres of oil productive territory in the United States, with 50,636 producing wells and 34,956 injection wells. These activities involved 1236 separate projects located in 254 fields.

E. O. Bennett, Ponca City, Okla., chief production engineer of Continental Oil Co., emphasized the importance of state regulations providing for multiple-zone completions wherever these are feasible, particularly in saving steel.

Harold M. Smith, U. S. Bureau of Mines, Bartlesville, Okla., reported that a total of 124 crude oil samples had been furnished for analysis through the cooperation of the committee. These crudes are being tested to determine their properties in relation to the production of war products.

Governor Leon C. Phillips of Oklahoma, chairman of the Compact Committee, and Governor Keen Johnson of Kentucky were principal speakers at the banquet.

■ ■

1942 Natural Gas Proceedings

The 1942 Natural Gas Proceedings will be available within a few weeks. Early publication has been made possible by the cooperation of those who took part in the New Orleans meeting and the efforts of the editor, James N. Beall, A.G.A., headquarters announced.

Pre-publication orders will be accepted at A.G.A. headquarters to be filled when copies are available. The price of the Proceedings is $2.00 to members, $4.00 to non-members.

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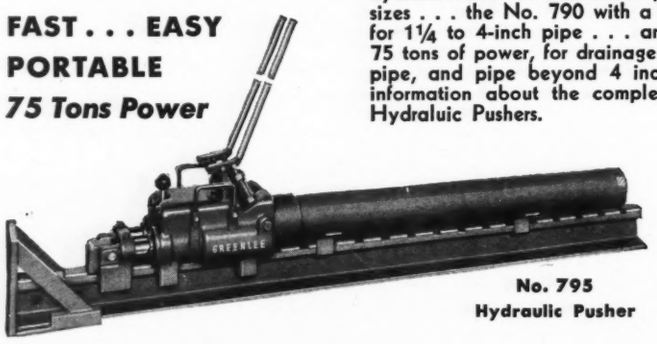

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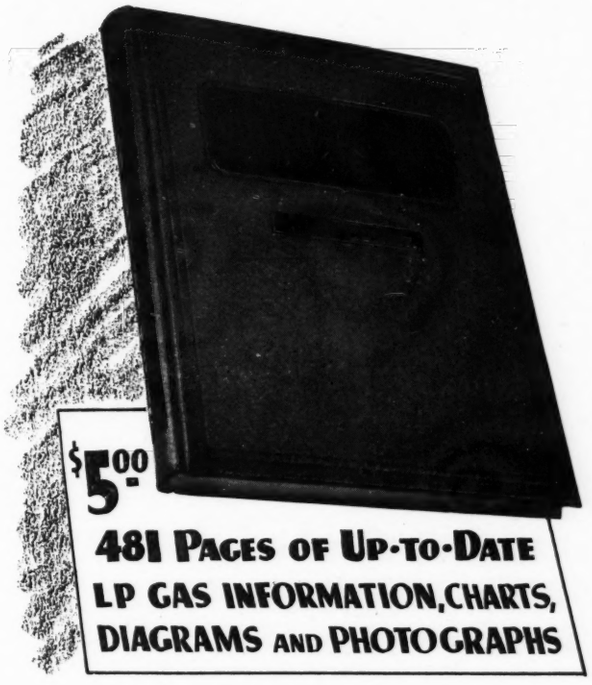

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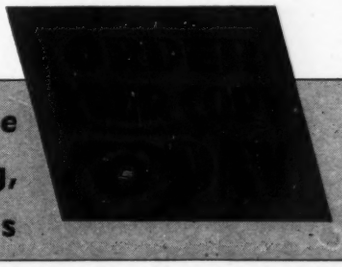

The Only Complete and Authoritative Reference Book on LP-Gas Engineering, Installation and Operating Methods

Southern Union Plans Reorganization

THE SOUTHERN Union Gas Co., Dallas, Texas, filed an amended application with the Public Utilities Division of the Securities and Exchange Commission May 13 offering a proposed plan for comprehensive readjustment and reorganization. The plan, subject to SEC approval and/or changes, is the last amendment to be filed. A. S. Johnson is president of Southern Union.

If carried out the plan will merge all operating companies into one new operating company. The Southern Union Production Co. will be continued as a wholly-owned, non-utility subsidiary of the new operating company. The new operating company will own its stock and will pay off all funded debt of the holding company and subsidiaries by a new 3½% first mortgage bond issue of $3,650,000.

The publicly-owned preferred stock of the holding company and the management subsidiary company will receive new 6% income debentures on basis of par for par. Accrued dividends on present preferred stock of the holding company will be liquidated one-half in new 6¼ income debentures and one-half in common stock of the new company.

The common stock of New Mexico Gas Co., Santa Fe, and New Mexico Eastern Gas Co., of Texas and New Mexico, will be exchanged for common stock of new company on the basis of 1½ shares of new common stock for one share of present common stock.

Southern Union Gas Co. common stock holders will receive one share of new common stock for one share of present common stock and in addition will receive one additional share of new common for one share of presently owned plus the payment of $1.50 in cash. Holders of $106,000 of long term debt of holding company will accept 53,000 shares of new common stock in payment thereof.

■ ■

Honolulu Corp. Hits Gasser

Honolulu Oil Corp.'s deep well in the Buena Vista field, turned out to be a gasser, producing 1,700,000 cu. ft. of gas per day, from a production zone running from 1695 from a total depth of 14,622 ft. where it was taken to explore the possibilities of a deep productive zone far below the normal production level of the field.

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Test Results Released on Condensate-Type Oil Wells

SEEKING more effective methods of developing extremely deep condensate-type oil wells, especially in the Gulf Coast area of Louisiana and Texas, the Bureau of Mines has studied experimental data obtained from one well in which gas and liquid constituents of reservoir fluids were subjected to a wide range of tests, Dr. R. R. Sayers, director of the Bureau of Mines, announced recently.

Data were obtained for the complete range of pressure, temperature, and mixture proportions in efforts to provide a reference scale for evaluating properties of fluids produced from similar wells at different gas-liquid ratios. The gas and liquids obtained from one well were recombined in different proportions to provide 10 natural hydrocarbon mixtures for study at pressures up to 5000 lbs. per sq. in. and at temperatures ranging from 70° to 280° F.

The research was conducted under a cooperative agreement between the American Gas Association and the Bureau of Mines. Tests were conducted at the Bureau's Petroleum Experiment Station, Bartlesville, Okla., by Kenneth Eilerts, physical chemist, and R. Vincent Smith, assistant chemical engineer.

A copy of the report, Report of Investigations 3642, "Specific Volumes and Phase-Boundary Properties of Separator Gas and Liquid Hydrocarbon Mixtures," may be obtained by writing the Bureau of Mines, Washington, D. C.

■ ■

Consumers Power Company Flint Changeover Completed

Adjustment of customers' appliances to burn natural gas instead of manufactured gas began in May in the Flint division of Consumers Power Co. and continued for some weeks until the premises of some 40,000 customers were visited. Some 200 trained service men were engaged in the job.

Natural gas now being supplied to the Flint area is from the Michigan fields. A pipe line extension which will bring Texas and Kansas gas to Flint is under construction near Adrian. With the completion of this pipe line, and a branch running west through Jackson to Kalamazoo, natural gas will be available to every community which Consumers now supplies with manufactured gas except Manistee, Alpena and Sault Ste. Marie.

■ ■

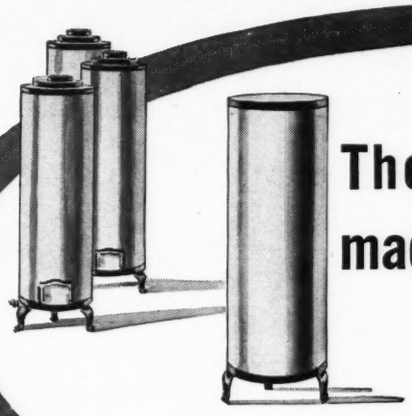
Mississippi River Fuel Corp. Cuts Rates in 21 Towns

Natural gas consumers in 21 Arkansas cities and towns will realize an annual savings of $28,252 from a reduction in wholesale gas rates agreed to by the Mississippi River Fuel Corp., St. Louis, Mo. Effective as of June 1, the Mississippi River Fuel Corp., which operates a natural gas pipe line from Louisiana to St. Louis, will establish a lower rate for gas sold to the Arkansas Power and Light Co., Pine Bluff, Ark., and the Arkansas-Louisiana Gas Co., Shreveport, La., for retail distribution.

■ ■

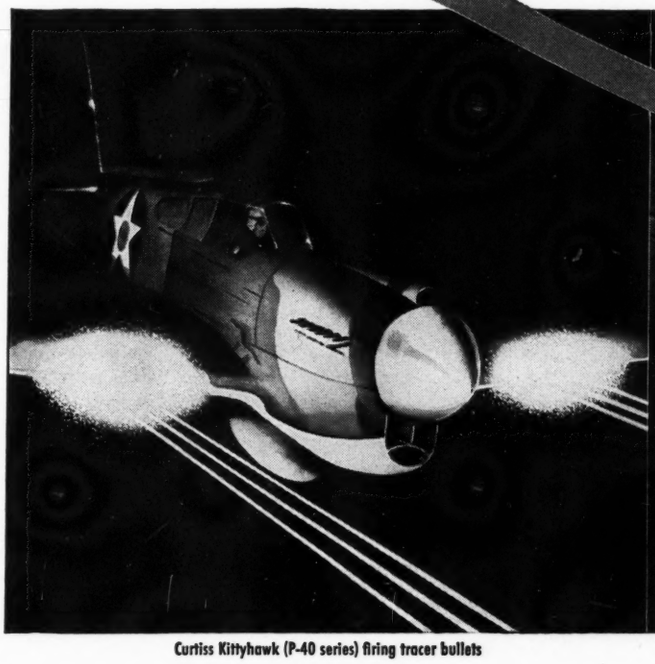
New Dehydration Plants

In order to prevent pipe line corrosion, thereby aiding the war effort by conservation of metals, Southern California Gas Co., Los Angeles, Calif., has constructed and is operating two diethylene glycol dehydration plants in Kern County, company officials have revealed. The plants, the first ones to be built on the Pacific Coast, cost about $15,000 each. They have a capacity of 25,000,000 standard cu. ft. per day.



The metal that might have made these *Everdur* tanks...

Instead makes these *Everdur* blenders for mixing tracer bullet powder



Curtiss Kittyhawk (P-40 series) firing tracer bullets

Everdur Cone Blenders made by the H. K. Porter Company, Inc.

EVERDUR* gets the call for this and many other vital war tasks for the same basic reasons that made this copper-silicon alloy so desirable for the construction of hot water tanks.

It is strong, rustproof and highly resistant to corrosion... it has a high endurance strength, fights fatigue... it is readily welded and ideally suited to engineering construction involving both wrought and cast parts.

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ABSTRACTS

• **ABSTRACTS of papers presented at the American Gas Association Technical Section Joint Conference, Production and Chemical Committees, Hotel Pennsylvania, New York, N. Y., May 25-26, 1942.**

New Principles in Heating Koppers-Becker Coke Ovens—Dr. W. C. Rueckel, Koppers Co., Pittsburgh, Pa. The new principles include recirculation of waste gases to effect long flame combustion when underfiring rich (coke oven) gas and the enrichment of lean (blast furnace and producer) gas to obtain maximum carbonizing speeds. These two developments are the result of a comprehensive research program carried on by Koppers Co. to obtain data on the fundamentals of combustion of the several gases used to underfire coke ovens. A discussion of the pertinent fundamental combustion characteristics of the several gases is given in the first part of the paper. In the portion of the paper dealing with recirculation of waste gases, mention is made of the various factors affecting the quantity of waste gas recirculated. The paper also describes the effect of waste gas recirculation on combustion characteristics of the rich gas-waste gas mixture. Mention is also made of the results obtained in several batteries employing this new method of waste gas recirculation. A portion of the paper dealing with the carbonizing rate obtainable when underfiring with lean gas describes the effect of enrichment on the combustion of such lean gases.

Increasing Plant Capacity to Meet Wartime Demands—L. J. Willien, Public Utility Engineering & Service Co., Chicago, Ill. The methods for peak load gas developed since 1935 are as follows:

Coal Gas: Producing a 450 B.t.u. coal gas in stopped end horizontal retorts and enriching to 520 B.t.u. increases gas production 10%. An increase of 48% is reported by the use of Silfrax bottoms; combined with retort oil process, the increase is 110%. Carbonizing a mixture of coal and oil (8.5 gals. per ton of coal) will increase gas production 11% if gas is diluted to 530 B.t.u. with producer gas. If diluted with blue gas, gas production is increased 22%. Diluting coal gas with blue gas instead of producer gas will increase gas production about 12%.

Water Gas: The use of a shorter operating cycle increases capacity between 10% and 15%. One company reports that increasing the generator blast rate from 9 M c.f. per minute to 11 M c.f. per minute increased the capacity of an 11-ft. set from 3000 M c.f. to 5000 M c.f. per day. An increase of 21% was obtained by using about 20% of the total on the backrun.

Mixed Gas: The amount of water gas that can be mixed with coal gas without causing appliance trouble can be increased by raising the water gas to 650 B. t. u. The possibilities of reforming oil in a water gas machine and making a gas similar to coal gas are covered.

High B. t. u. Gas: A satisfactory substitute for natural gas has been made in a water gas machine using butane instead of gas oil. A butane air gas of about 1530 B. t. u. has been mixed with natural gas up to 70% and distributed to 58,000 consumers with satisfactory results.

Selection of Coals for Wartime Carbonization by Means of an Improved Engineering Model of the Coke Oven—J. H. Swiniarski, M. C. Cryan, and V. J. Altieri, Eastern Gas & Fuel Associates, Everett, Mass. New apparatus and procedure furnishing data that will enable one to decide what coals or coal blends can be carbonized without retarding production by sticking and without damaging coke ovens is available by which lateral and vertical stresses, and lateral and vertieal strains are all measured and/or controlled. The model will maintain unidirectional flow of heat producing plastic zones having plane surfaces, or it may be operated to cause some coking downward from the top and/or upward from the bottom. Thus it avoids incorrect data given by devices that permit dissipation of stress of an unmeasured amount caused by plastic flow and erratic upward movement of the charge.

Report on the Lynn Gas & Electric Co. Procedure of Dehydrating Bunker "C" Tar Emulsion and Coke Oven Tar Emulsion—C. J. Leuders, Lynn Gas & Electric Co., Lynn, Mass. The dehydrator stills consist of two cylindrical steel tanks, 30 ft. long and 10 ft. in diameter mounted horizontally on concrete bases. The outside of these tanks is covered with asbestos block insulation of 1½-in. thickness and then coated with a ¼-in. waterproof coating of asbestos and cement. Each dehydrating tank operates as a unit. A batch of approximately 14,000 gals. of 40% to 50% emulsion is pumped into tank. Steam at 120 lbs. pressure is added slowly and temperature of mass is brought to 212° F. and the steam is then shut off to avoid violent distillation. Approximately 10 hours are required to bring the mass up to this temperature. The batch is then allowed to settle for about 12 hours and free water is drawn off through the test valves. After all the free water has been drawn off, the steam is again turned on and the batch is boiled for 12 hours at 212° F. The batch is then allowed to settle for another 12 hours and then the free water is again drawn off. The above process is repeated until the tar is dry. Normally four or five complete cycles of treatment are necessary to reduce the emulsion down to less than 1% water content. During the final heating, the temperature is allowed to rise to about 220° F.

Scientific Methods Applied to Accident Prevention—W. M. Pierce, The Employers Liability Assurance Corp., Ltd., Boston, Mass. Some gases give warning by odor or irritant action, others are more insidious. The latter are difficult to detect except by chemical or physical means; industrial poisoning is generally by chronic effect; susceptibility differs greatly in individuals. Instruments and methods available for detection of carbon monoxide, benzene, and toluene indi-

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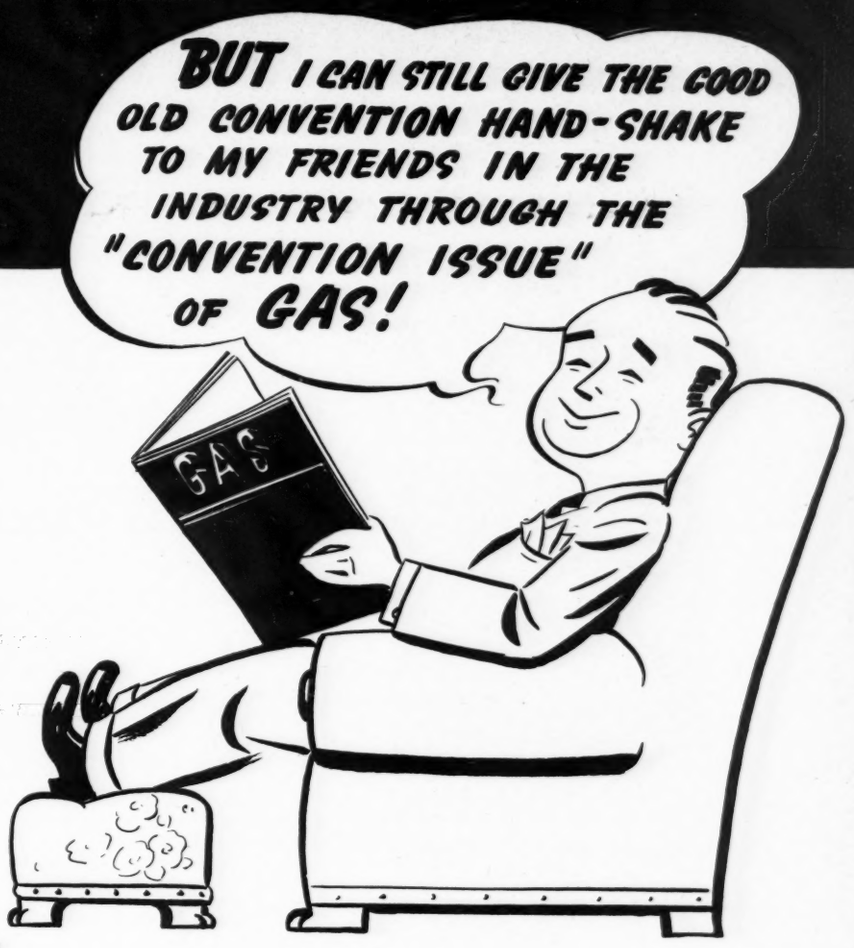
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GUEST EDITOR

R. S. FULLER, *President*
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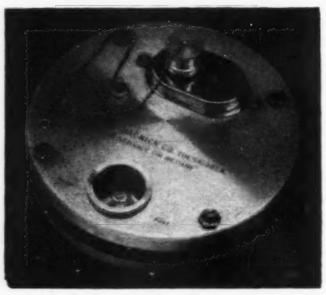

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cate the possibilities of research work involving chemical and physical methods to detect other hazards. A survey made of type and concentration of toxic and explosive hazards in the gas industry would indicate which require control. A committee formed to correlate and publicize accident data would benefit all.

Corrosion of Stainless Steel by Flue Gases—Louis Shnidman and Jesse S. Yeaw, Rochester Gas & Electric Corp., Rochester, N. Y. A continuation of previously reported investigations on the corrosion of metals, such as may be used for flue linings, by the condensing products of combustion of gaseous fuels. Thirteen samples of "stainless" steels of varying composition, and from different sources, were exposed to combustion products for a period of two years. For the first half of this period, little corrosion was observed. After 15 to 19 months, corrosion began at a rapid rate on nearly all samples and in some cases was very severe. On the basis of the final results, flue linings made of these "stainless" steels, with the exception of those containing molybdenum, would have an average life expectancy of about three to four years, on continuous exposure to an atmosphere of condensing combustion products.

A Recording Apparatus for Determining Trace Concentrations of Certain Impurities in Industrial Gases—W. E. Stackhouse, The United Gas Improvement Co., Philadelphia, Pa. Describes the development and operation of a continuously recording calorimeter for indicating and recording the concentration in a gas stream of such contaminants as nitric oxide and hydrogen sulphide. Illustrations of the instrument are shown, together with reproductions of sections of the recording chart that it produces.

Microanalysis of Ash—Frieda Fuchs, The Pennsylvania State College, State College, Pa. The determination of ash of coal is simplified and the time required for a determination shortened by applying procedures of micro- and semi-microanalysis. By using samples of coal of 3 to 50 mg., ash determinations were made, giving results consistent with those of standard determinations. The heating time required was 20 to 30 minutes for each determination.

■ ■

Current Periodicals

Protecting Buried Metals Against Corrosion—Starr Thayer. *Oil and Gas Journal*, April 2, 1942, p. 37. The author mentions briefly the various types of corrosion from the standpoints of methods used to combat it. His main concern, however, is with underground structures, such as pipe lines, which suffer a corrosion loss of upward of $100,000,000 yearly. Protective coatings have been developed which constitute a long step toward elimination of pipe line corrosion, when applied to new pipe. Older lines can be protected by a cathodic process, based on correcting the galvanic differences in potential between small sections of the pipe wall, or changes in soil conditions. The process of making the pipe cathodic to the surrounding soil is described, illustrations of the practical effects of the method being given.

Construction and Operating Features of East Texas Cycling Plant—F. H. Love. *Petroleum Engineer*, April, 1942, pp. 31-34. Operating at a present capacity of 42,500,000 cu. ft. a day, 34,000,000 cu. ft. is returned to producing zones at pressure of 3400 lbs. p.s.i.

War-Time Protection of Industrial Plants—*Chemical and Metallurgical Engineering*, Jan., 1942, pp. 102-108. Sabotage by fire is the most dangerous of all war-time enemies of American chemical and process industries. Fortunately, protection against such damage can be had by strict adherence to orthodox methods of fire prevention, although it will be necessary to double and triple normal peace-time measures. Common sense and stern precautionary steps are the best protections against all types of sabotage and espionage of industrial chemical and process plants. Enemy air raids may consist of efforts to cripple or destroy certain industrial plants by the use of incendiary bombs. Magnesium incendiaries are relatively harmless if properly understood and fought. A fine spray of water can quickly extinguish them and prevent damage in most cases. However, it is first necessary to have proper equipment in sufficient quantities, properly trained personnel and many sources of water in order to fight such bombs successfully. Reasonable protection of equipment and personnel from distant effects of high explosive bombs can usually be obtained from light weight shutters and other simple methods. Blackouts can best be accomplished by the use of proper screens or baffles, although most plants require individual study before protective steps are taken.

New Laboratory Is Contribution to Research in Petroleum Field—*National Petroleum News*, Feb. 4, 1942, pp. R-40-42. The new research and development laboratory of the Standard Oil Co. of Ohio which was formally opened the first of this year, is now in full operation upon vital research problems linked directly to America's fight for victory. One of its unique features is that it is located upon a university campus, removed from the hustle of the company's refinery. This academic atmosphere assists the fundamental research thinking of the individual and relieves him of thought interruptions that occur in refinery trouble-shooting problems, common to most petroleum research.

Internal Scrapers Adapted to Gas and Vapor-Carrying Lines—R. M. Sanford. *Oil and Gas Journal*, Feb. 19, 1942, pp. 33, 37. Efficiency of lines transporting gas is greatly affected by the internal condition of the pipe. The presence of scale, water, or roughness in the pipe will cause the actual carrying capacity to vary from the capacity as computed by Weymouth's formula. By running scrapers through the pipe, the capacity can be increased in some cases to greater than the calculated capacity. Describes various types of scrapers, or go-devils, used.

Gas Cycling Increases Recovery—Neil Williams. *Oil and Gas Journal*, April 23, 1942, pp. 61, 62. Gas cycling has been undertaken by owners of combination oil and gas wells in the Otis field, Rush and Barton counties, Kan., as a means for attaining maximum oil recovery before reservoir pressures in the field are depleted by gas withdrawals for pipe line outlets. Production allowables have been predetermined covering a period of nine years, one year under the estimated economic life of the field's gas resources. The program calls for the return to the producing horizon of all gas not taken by pipe line outlets.

Method of Determining Pipe Line Corrosivity Due to Soils—P. F. Marx. *Petroleum Engineer*, Feb., 1942, pp. 29-32. Instrument developed is based on correlation of soil corrosivity to U. S. Bureau of Standards pipe specimens.

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IT CAN NEVER
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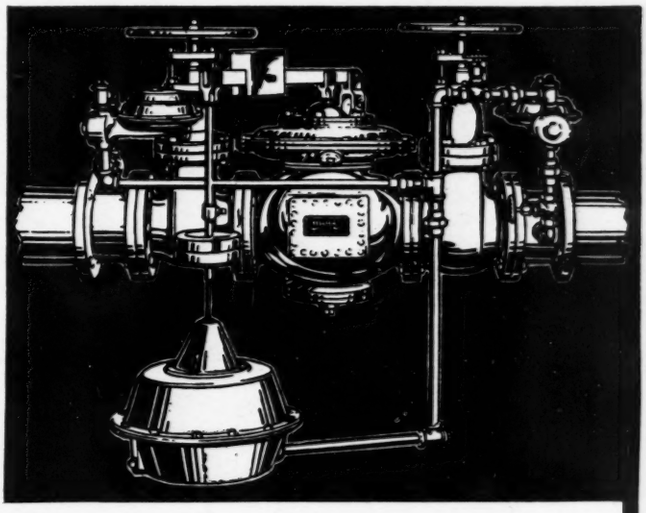

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PEOPLE

The Melchett medal, awarded annually by the Institute of Fuel, of England, for outstanding achievement in work involving the scientific preparation or use of fuel, will be presented this year to **Dr. Arno C. Fieldner,** Chief of the Technologic Branch and Chief of the Coal Division, Bureau of Mines, according to advices received from the Council of the British Institute of Fuel by the Department of the Interior.

Dr. Fieldner, a chemical engineer and scientific research worker for 35 years in the department, thus will become the second American so honored since the medal was awarded in 1930. Among the earlier recipients of the award are: Charles M. Schwab, of the United States; Sir John Cadman (the late Lord Cadman) of England; Dr. F. Bergius of Germany; and Mon. Ettienne Audibert, of France.

• •

Frank H. Dotterweich, professor of natural gas engineering, Texas College of Arts and Industries, Kingsville, has been appointed a consultant to the Natural Gas and Natural Gasoline Division of the OPC in Washington.

Concluding 39 years of service with the Philadelphia, Co. and Subsidiary Companies, Philadelphia, Pa., **Joseph McKinley,** vice-president in charge of sales, retired in June. Upon his retirement, **G. W. Ousler,** was placed in charge of sales for the Duquesne Light Co., a subsidiary, and **B. F. Jones** was appointed to direct the sales and service activities for the Equitable Gas Co. and the Pittsburgh and West Virginia Gas Co.

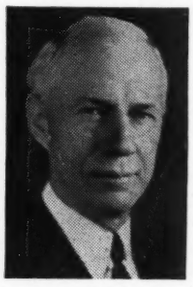
• •

In tribute to his "leadership in the industrial activities of Evansville," **Louis Ruthenburg,** president of Servel, Inc., Evansville, Ind., and president of the Indiana State Chamber of Commerce, was awarded the Evansville Rotary Club's service award for "outstanding community service during the past year."

• •

It is Lieutenant Commander instead of sales manager **P. J. Griffin** now. Servel, Inc., has released him to the Navy after 16 years with the company in which he has recently been district sales manager for the eastern Pennsylvania territory.

Announcement was made July 1 that **Conrad N. Lauer** has resigned as president of The Philadelphia Gas Works Co. He will remain with the company as director and chairman of the Board, and will also continue as a director and as a vice-president



Hudson W. Reed

C. N. Lauer

of The United Gas Improvement Company. **Hudson W. Reed,** executive vice-president of The Philadelphia Gas Works Co. since March 28, 1936, was elected president to succeed Mr. Lauer.

Mr. Lauer has been a distinguished figure in the gas industry for many years and has been an outstanding leader of American Gas Association activities, heading many important committee projects. He served as president of the Association in 1938-1939 and, until May of this year, was a director for a number of years. Upon his resignation as a director, the A. G. A. Executive Board on May 4 adopted a statement calling attention to his contributions and fine character. He is also a past president of the American Society of Mechanical Engineers and a member or officer of many business, honorary, social and civic organizations.

• •

At the conclusion of 46 years of service, **W. Cullen Morris** retired in June as vice-president of the Consolidated Edison Co., New York, N. Y. He had yielded his administrative duties with the company in December, 1940, but had been retained to act as a consultant on special assignments. For the past year and a half, he had acted as chairman of the System Defense Committee. The career of Mr. Morris in the gas industry began in 1896 when he joined the New Amsterdam Gas Company and the New York and East River Gas Company as an engineer's assistant a few months after graduating from Stevens Institute of Technology. In a series of promotions, he became assistant superintendent of works and then chief engineer of both companies. Among his other connections, he was with the Consolidated Gas and the Astoria Light, Heat and Power Companies, the Consolidated Gas Company, and at the time of the merger of the various gas and electric companies into the Consolidated Edison Company he was made a vice-president. He has authored many technical papers and is inventor of a process for the liquid surface drain for gas holders.

• •

G. E. Foster, controller of the Brooklyn Union Gas Co., Brooklyn, N. Y., has been elected president of the New York City Control of the Controllers Institute of America.

• •

United Gas Pipe Line Co. and affiliated companies are jubilant over receiving word that a former employee of their organization was a member of General Jimmy Doolittle's squadron on their recent Tokio tour. **Lieutenant James M. Parker,** Livingston, Tex., left the company in October of 1940 to enlist in the Air Corps.

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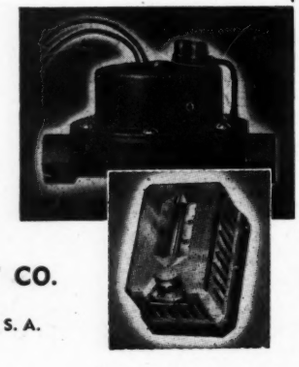

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The advertising office of Servel, Inc., has been transferred from New York City to the home office at Evansville, Ind., it was announced by **George S. Jones, Jr.,** vice president and general sales manager of the company. Coincident with this announcement, the appointment ment of **R. J. Canniff** as advertising and sales manager, following the resignation of **William Reynolds** of New York as Servel's advertising director was revealed.

R. J. CANNIFF

Mr. Canniff has been sales promotion manager of Servel since August, 1939. Prior to his connection with Servel, he was associated, in various executive capacities, with the Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y.; the Standard Gas Equipment Corp., Chicago, Ill.; Pittsburgh Water Heater Co., Pittsburgh, Pa., and the Ruud Manufacturing Co., Pittsburgh, Pa.

Mr. Canniff is an authority on gas appliance sales training and is the author of many articles on this subject. He is an active representative for his company on the American Gas Association's Refrigeration Committee, and was a director on the first board of the Association of Gas Appliance and Equipment Manufacturers.

• •

Wilma Mae Hannah has been added to the home service department of The Gas Service Co., Kansas City, Mo. Miss Hannah is a graduate of Kansas State College with a B. S. degree in home economics. **F. M. Rosenkrans,** general new business manager of the company, has announced that **Miss Florence Marie Columbia** has been appointed home service director at Pittsburgh, Kan. Miss Columbia is a graduate of the University of Kansas. **Miss Gertrude Mensch,** who has been with the Newton office of the company, has been transferred to Arkansas City; **Miss Laura Randall,** formerly at the Warrensburg office, has been transferred to Neosho; **Miss Mary Ann Bair,** formerly at the Joplin office, has been transferred to the St. Joseph office, where she will assist **Miss Helen Lillibridge,** home service director there.

• •

A. W. Gaugher director, Mineral Industries Research, and **F. C. Todd,** assistant professor, Petroleum and Natural Gas Engineering, both of Pennsylvania State College, received the Charles B. Dudley Medal of the American Society of Testing Materials at the society's annual meeting in Atlantic City, June 24. The award was made for a joint paper presented in 1941 which describes the author's extended work in developing a precise laboratory field method for estimating moisture in fuel gases. The investigation involved the building of special equipment and carrying out of numerous research projects.

• •

Resigning from his post as Washington Representative of the A. G. A. E. M., **H. A. Watson** has become affiliated with the Lincoln Brass Works, Inc., Detroit, Mich. Prior to his Washington appointment with the A. G. A. E. M. he had been national sales counsellor for the CP gas range manufacturers.

• •

H. S. Christman, sales manager, the Philadelphia (Pa.) Gas Works Co., has been made a director of the company.

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Lincoln Heavy-Duty Airline Drum Pumps are available in pressure ratios to meet all requirements.

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PEOPLE

F. E. Seaver, secretary of the Southern California Gas Co., Los Angeles, Calif., since 1938, retired August 1 on the company's uniform pension and benefit plan. Behind him is a record of 35 years in Southern California Gas and predecessor companies. He began work with the gas company as a bookkeeper, and over a period of 10 years rose to the position of superintendent of the Los Angeles office in the Los Angeles Gas and Electric Company.

In 1917 he became assistant secretary and was elevated to the position of secretary in 1928. He was also a director of that company for many years. With the merger of Los Angeles Gas & Electric with Southern California Gas Co., he became assistant secretary, and in 1938 he succeeded C. L. Whitehill as secretary.

At a recent board meeting of the company, **R. R. Blackburn** was elected secretary to fill the office which will become vacant on the retirement of Mr. Seaver, according to an announcement by **Franklin S. Wade,** president.

• •

B. H. Smyers, Jr., secretary-treasurer of the Pennsylvania Natural Gas Men's Association, has been granted a leave of absence for military service. A veteran of World War I and a reserve officer in the Air Corps for 15 years, Mr. Smyers has received the commission of Captain in the Army Air Corps.

Paul L. Kesel has been appointed acting secretary-treasurer in charge of financial matters for the Pennsylvania Natural Gas Men's Association. **Mark Shields** executive secretary, will assume Mr. Smyers' secretarial duties.

The appointment of **Charles A. Mabey** as director of research activities has been announced by the Bristol Co., Waterbury, Conn., manufacturers of industrial process instruments and automatic control apparatus. Mr. Mabey is a Harvard graduate and did advanced work in physics at both Harvard and M. I. T. He has also been associated in research work with International Communications Laboratories of New York, Federal Telegraph Co. of Newark, N. J., and with Mathieson Alkali Works of New York. He is a member of the American Physical Society.

• •

Harrison M. Pauley, manager of the Wisconsin Gas & Electric Co.'s Kenosha, Wis., branch, has been elected president of the Chamber of Commerce of that city.

• •

Ronald F. Crawford has been assigned to the duties of production engineer at Athens, Texas, for Lone Star Gas Co., where he will be supervised by **M. O. Attebery, Jr.**

• •

Sales manager **E. G. Peabody,** of the Citizens Gas and Coke Co., Indianapolis, Ind., has become a lieutenant in the Army Air Corps. Prior to his Citizen's connection, he was sales manager of the Central Indiana Gas Co., Muncie, Ind.

• •

W. M. Shaefer has succeeded **E. F. Kloer** as director of gas utilization for the Johnstown Fuel Supply Co., Johnstown, Pa. Mr. Kloer has been appointed vice-president and general manager of the Lake Shore Gas Co., Ashtabula, Ohio.

Deke Houlgate, representative of the American Gas Association for the Motion Picture Industry, Los Angeles, Calif., has been commissioned a first lieutenant in the U. S. Army Air Corps and reported July 27 to the West Coast Air Corps Training Center at Santa Ana, Calif. Mr. Houlgate is nationally known as a statistician and prognosticator on the subject of football, having accumulated innumerable records and developed the Houlgate system for the comparative rating of football teams.

Deke Houlgate

• •

During the month of June, McCarter awards were presented to **William G. Wilson** and **Alfred Vitti,** employees of the Consolidated Edison Co., New York, N. Y. for their outstanding acts of life saving. Mr. Wilson received the McCarter bar and certificate which are awarded to a two-time winner of this coveted honor. Mr. Vitti was presented with a McCarter medal and certificate.

• •

James Argo has been appointed sales manager of the Tampa Gas Company, Tampa., Fla., by **A. H. Stack,** president. Mr. Argo has been in charge of gas sales for the Florida Power and Light Company's Miami property since 1940. He is chairman of the Sales Committee of the Gas Meters Association of Florida-Georgia.

• •

D. M. McCallister of Monroe, Mich., has been appointed manager of the Wisconsin Fuel & Light Co., Manitowoc, succeeding **T. J. Danehy,** who died recently. Mr. McCallister has been associated with the parent company, the National Gas & Electric Co., since 1911. He was manager of the National Utilities Co. plant at Monroe, Mich., since Sept. 1, 1933.

• •

J. G. Rollow has been relieved of his duties as supervising engineer for Southern California Gas Co., Los Angeles, in order to devote full time to the company's butadiene production program as engineer in charge of construction and operation. **Guy Corfield,** research engineer, has been placed in charge of research and experimentation in connection with the project.

B. M. Laulhere, technical supervisor, will take over supervision of the Civil, Design, and Constructing Engineering departments, and **Grove Lawrence** who has been transferred from the Kern Division, will handle the duties of the Manufacture, Compression, and Storage department in Los Angeles. These departments had formerly come under Mr. Rollow's supervision.

Herbert Dwight, superintendent of the San Joaquin Valley division, will be transferred to Taft to replace Mr. Lawrence.

• •

Elizabeth Sweeney, past chairman of the Home Service Committee of the American Gas Association, has been advanced to assistant professor of household technology at Syracuse University. Miss Sweeney has been an instructor in this department for several years, prior to which she was home service director of the New York State Electric and Gas Corp., Geneva, N. Y.

MUELLER "N" DRILLING MACHINE

Ideal for drilling through gate valves — sizes 2" to 4" inclusive — under high pressure.

For cutting in laterals, large services, etc.

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THE QUALITY OF PAYNEHEAT EQUIPMENT IS STANDING USERS IN GOOD STEAD TODAY!

★ ★ ★

George W. Baldwin, for many years Roper Representative in Delaware, District of Columbia, Maryland, Virginia, and parts of North Carolina, West Virginia, Tennessee, and Pennsylvania has been called to Washington as an industrial specialist with the War Production Board. He will work under the direction of H. M. Brundage, chief of the Appliance Section of the Plumbing and Heating branch.

• •

E. M. Meyers, for seven years gas and electric engineer of the Oklahoma Corporation Commission, has resigned to become senior engineer of the Gas Division of the Power branch of the War Production Board. Before joining the staff of the Corporation Commission, he had been with the Southwestern Light and Power Co., Chickasha, Okla.

• •

The Consumers Gas Co., Toronto, Ont., has announced the appointment of **George M. Knight** to the position of engineer in charge of construction and maintenance. He came to Consumers from the West Gas Improvement Co., Inc., New York, N. Y., where he had been assistant manager of the company.

• •

W. J. Amoss, director of advertising for New Orleans Public Service Inc. has been commissioned a lieutenant in the U. S. Naval Reserve, stationed in New Orleans and serving as assistant to the director of the Office of Naval Officer Procurement.

Obituaries

O. H. True

Oscar Hill True, 64, head of United Gas Pipe Line Co., Shreveport, La., property tax department, died May 28 of coronary thrombosis after an illness which lasted but a few hours.

Mr. True was born February 18, 1878, in West Point, Tenn. He joined United in 1929 at Houston as a member of the right-of-way department, and became head of the property tax department in 1937.

■ ■

T. J. Danehy

Thomas J. Danehy, vice president and manager of the Wisconsin Fuel & Light Co., operating the gas utility in Manitowoc, died recently. Mr. Danehy had been manager of the Manitowoc properties of the company for the past 15 years. Active in the gas section of the Wisconsin Utilities Association, Mr. Danehy was elected chairman of the section in 1935.

• •

L. O. Gordon

Leroy O. Gordon, widely known utility exexutive, died June 17 in Birmingham, Ala. He was 59 years of age.

Mr. Gordon, who was president of the Peoples Water & Gas Co., Meridian, Miss., went to Birmingham from New York to direct the southeastern operations of his company. He was a prominent member of the American Gas Association.

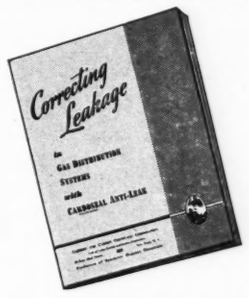
■ ■

C. D. Henry

C. D. Henry, former sales manager, Peoria division of the Central Illinois Light Co., Peoria, Ill., died June 17. He had been ill for more than a year.

You Save in 4 WAYS When You Use "CARBOSEAL" ANTI-LEAK

. . . for Long-Term Correction of Dry Bell-and-Spigot Joint Leakage



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You too can do what others have already accomplished with "Carboseal" Anti-Leak treatment. Plan now to start using this accepted method for reducing your unaccounted-for-gas loss . . . This 20-page book tells more about "Carboseal" Anti-Leak treatment —how it can be applied by either the gravity or the hose method, how much it costs, and what results can be obtained. Write for a copy today, without obligation.

1. You Save Labor

The application of "Carboseal" Anti-Leak requires only a few filling connections on the main—four per mile is the average. Costly and time-consuming excavation and repaving are almost entirely eliminated. Only a small crew is required.

2. You Save Critical Materials

Quantities of steel and rubber—both required in the mechanical method of correcting bell-and-spigot joint leakage—are not needed in the "Carboseal" Anti-Leak chemical treatment.

3. You Save Gas

In typical applications in dry gas systems "Carboseal" Anti-Leak reduced unaccounted-for gas 60 per cent . . . 85 per cent . . . in many cases, 100 per cent.

4. You Save Money

The experience of 16 users who treated over 200 miles of main indicates that the average cost of "Carboseal" Anti-Leak treatment is about 50 cents per joint . . . a fraction of the cost of leakage correction by other means.

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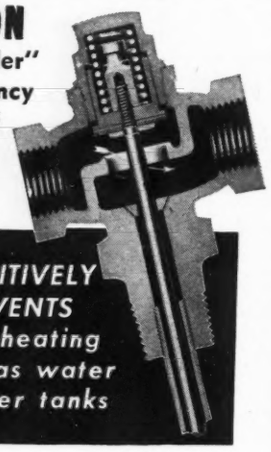

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The Kitson DEFENDER Valve shuts off the main gas supply before dangerous water temperature is reached . . . Gives positive protection, until trouble is remedied. Guards against possible "sticky" thermostats . . . specified by many gas companies as standard equipment. Write for details. No obligation.

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850 BASO SWITCH
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COMPACTNESS
RAPID TIMING
GREAT FLEXIBILITY
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Census Issues Gas Production Survey

NEARLY 200,000 persons worked in petroleum and natural gas production in 1939, the Bureau of Census has just reported in the first comprehensive census survey of the industry since 1919. The figures show that 7782 companies were engaged in the production of oil and gas and that at the end of 1939 they operated 300,179 oil and gas wells and 47,466 gas wells.

The Census Bureau figures do not agree strictly with those published by the Bureau of Mines. For example, the oil producers covered by the census produced 1,228,134,000 barrels of crude oil in 1939, compared with Bureau of Mines production of 1,264,962,000 barrels. The census reports 300,179 oil wells, while the Bureau of Mines shows 380,390 operating at the end of 1939. However, the census report gives operating facts in much greater detail and reveals the distribution of operating expenses and many other figures not published in Bureau of Mines reports.

Total value of products of the industry, $1.472,291,339, exceeded that of any other mineral industry and accounted for 43% of the total for all mineral industries.

Principal expenses included $199,732,062 paid to contractors for drilling wells (about 60% of the 22,560 wells drilled in 1939 were completed by contractors), $168,382,732 paid direct for labor to an average 113,498 wage earners, $83,844,270 in salaries to 32,327 salaried employees, $86,690,393 for supplies and materials, $26,059,971 for fuel, and $7,093,569 for purchased electric energy. The latter items do not, of course, include sums expended for similar purposes by drilling contractors and covered in their expenses.

Total drilling costs for the 22,560 wells amounted to $404,904,000, or an average of about $18,000 a well. Dry holes which failed to find oil totaled 3703, indicating that $70,000,000 was spent by the petroleum industry with no return.

The complete census report gives a breakdown of all principal facts of drilling and operating oil and gas wells, including all figures for the principal producing states. Included are data on footage drilled, costs, manhours of labor, contracted drilling, well servicing and maintaining, etc. Copies of the report, "Mineral Industries, 1939: Crude Petroleum and Natural Gas," may be obtained from the Bureau of Census.

Ohio Fuel Gas Rate Questioned by FPC

The Federal Power Commission July 22 announced its order instituting, on its own motion, an investigation of The Ohio Fuel Gas Co., Columbus, Ohio. The order states that the investigation is for the purpose of enabling the Commission to determine whether the Ohio company is a natural gas company within the meaning of the Natural Gas Act, and whether any of the company' rates or charges are unjust,, unreasonable, unduly discriminatory, or preferential.

By an order dated March 17, 1942, Ohio Fuel was required to show cause why the Commission should not determine that the rate agreement with Anchor Hocking Glass Corp. is unjust, unreasonable, or unduly discriminatory, and why the agreement should not be made the subject of an investigation. Today's order states that "Ohio Fuel filed its response to that order on April 20, 1942, which response failed to show cause why the Commission should not make such determination and investigation."

■ ■

FPC Approves Relocation Of United Gas Co. Line

The Federal Power Commission July 10 authorized the United Gas Pipe Line Co., Shreveport, La., to remove a portion of its Rodessa Loop lines extending from the Rodessa Field in northwestern Louisiana in accordance with an application filed by the company on May 20.

After reconditioning, the pipe and equipment will be used to replace and relocate that section of the company's Latex-Forth Worth line passing through Longview, Texas, to meet rising demands for natural gas in the Dallas and Fort Worth area, and the company has been authorized, subject to any further requirement of Section 7 (3) of the Natural Gas Act, to use the remainder of such pipe and equipment on its pipe line system as conditions dictate. The work is to be done without interruption of service.

■ ■

C. N. G. A. Organizes Work With Special Committee

With a number of its members serving on various government and war committees, the formation of a War Activities Committee, consisting of these men, as a move to coordinate the aid which the natural gasoline industry can give the war effort, is announced by the California Natural Gasoline Association.

The committee consists of W. W. Robinson, The Texas Co., and a member of the California Oil Industry Salvage Committee, chairman; William Moeller, Southern California Gas Co., chairman of the Natural Gas and Natural Gasoline Committee, District 5; H. L. Eggleston, Gilmore Oil Co., chairman, Temporary Sub-committee on Natural Gasoline and Coordination of Iso-butane, District 5; P. S. Magruder, General Petroleum Corp., member of the Oil Industry Protection Committee; and R. D. Gibbs, chairman of the C. N. G. A. Gas Report Committee. Ex officio member of the committee is George L. Tyler, C. N. G. A. secretary.

In the WAR PRODUCTION PROGRAM

It's SPEED and DEPENDABILITY that Count Most . . .

that's Why "CLEVELANDS" Are Indicated for the Trenching Jobs

Clevelands are "in the thick of it" digging trench on various U. S. Government projects and working on many utility pipeline jobs necessary to supply the thousands of cu. feet of gas required in our "all out for victory" program.

Compact, fast, flexible and mobile Clevelands are easy to operate. Rugged and amply powered for the toughest tasks, they are delivering maximum footage day in and day out, on every job and reducing to a minimum service interruptions.

Illustration at the left shows the famous "BABY DIGGER"—CLEVELAND MODEL 95—the pioneer small trencher, known and used throughout the gas industry. Its wide range of cutting widths and all-around value have made the "MODEL 95" supreme as a general purpose gas company trencher.

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"Pioneer of the Small Trencher"

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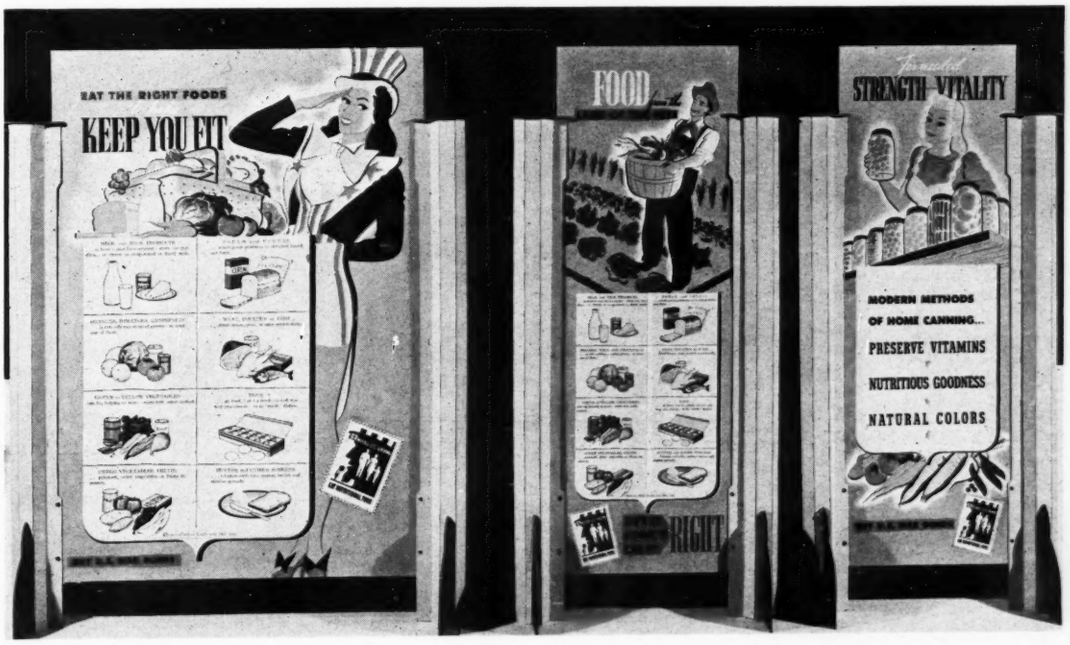
Illustration at the right is an important "Cleveland" feature. Truck speed transportation on special trailers. They load and unload in 10 to 15 minutes.

COLORFUL "NUTRITION" DISPLAYS



(J42-7) "NUTRITION" JUMBO DISPLAY. Size 29½"x42", on heavy seasoned cardboard, double-faced with same display on both sides and with Two-way Display Standard for standing.

(GB42-7) "NUTRITION" BACKGROUND DISPLAYS. Each set includes two cards, size 14¾"x42", double-faced on heavy seasoned cardboard, and with Two-way Display Standards for standing.

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1 to 3	$4.90 each	1 to 3 sets	$4.95 per set
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Backed by over 64 years' experience in gas purification, Connelly engineers will gladly make an analysis of your problems and submit unbiased recommendations without obligation.

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PRODUCTS

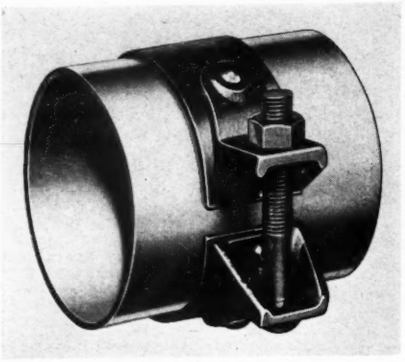
Pipe Clamp

Dresser Manufacturing Co., Bradford, Pa.

Models: Band Pipe Clamp, Style 774.

Application: For the quick repair of small pin holes, leaks and splits in straight runs of pipe.

Description: The clamp is made of a heavy, one-piece steel band of circular, split construction, with a riveted bolt lug at each end. A track-head bolt pulls the ends securely. To install, the clamp is sprung apart



until it can be slipped around the pipe and over the gasket or packing; then it is bolted up to make a firm, leak-proof repair. A special cone gasket, furnished when specified, has two molded rubber tabs which aid in positioning the gasket over the pin hole or leak. Sizes range from 1 in. I.D. to 26 in. I.D. Band widths vary from 2 in. to 6 in., with thicknesses from 1/16 in to 1/8 in.

■ ■

Name Plate Substitute

Avery Adhesives, 451 East Third St., Los Angeles, Calif.

Model: "Kum-Kleen" substitute.

Application: A substitute for name plates, metal tags, identification, patent number, and instruction tags.

Description: "Kum-Kleen" is a recently developed product which adheres permanently to any smooth surface, including metals, glass, plastics, enamel, varnish, and wood. It is applied without moistening and will adhere even when exposed to high temperatures or changing climatic conditions, states the manufacturer. They eliminate the necessity of drilling, taping, and riveting in application, yet have the permanent quality of steel tags now being conserved for war production.

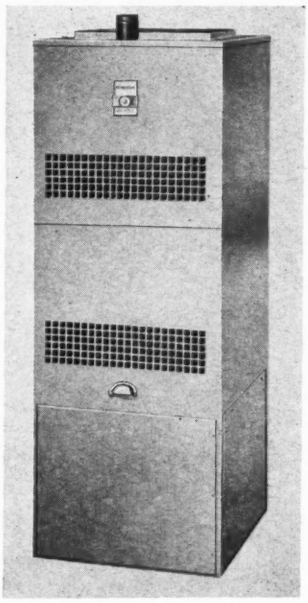
■ ■

Winter Air Conditioner

American Radiator & Standard Sanitary Corp., Box 1226, Pittsburgh, Pa.

Model: The Oneida Gas-Fired Winter Air Conditioner.

Description: The manufacturer states that the Oneida Gas-Fired Winter Air Conditioner is a moderately priced unit with blower un-



derneath burner, and occupying maximum space of 26 by 24¼ in. Heating element and radiator of steel, with large heating surface for good efficiency. Quiet, dependable burner, built-in draft hood, and equipped with all controls. Completely assembled and wired for labor-saving installation. Three sizes — 28,000, 40,000, and 56,000 A. G. A. B.t.u. output at bonnet. Air volume (c.f.m. range), 400-700.

■ ■

Folding Stretcher Outfit

Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh, Pa.

Model: M. S. A. Folding Stretcher Outfit.

Application: The M. S. A. Folding Stretcher is a new-type stretcher outfit designed for locations where a compact unit is desired.

Description: The Folding Stretcher, which is only 48 in. long when folded, is quickly opened to full size Army type. The frame is made of selected dried ash, and all metal parts are of malleable iron. The cover is of 12-oz. duck. Included in the all-weather dust-proof steel case (only 53 in. long) are the folding stretcher, a wool and a rubber blanket, four wood splints, two chemical hot pads and a 16-unit all-weather first aid kit. An instruction sheet is furnished with each outfit.

■ ■

Multi-Point Recorder

Cambridge Instrument Co., Inc., 3732 Grand Central Terminal, New York, N. Y.

Model: Multi-Point pH Recorder.

Application: Records pH at separate and independent points in a fluid-flow system. Provides a "before and after" picture of pH that enables the operator to see the effectiveness of the process in use.

Description: The manufacturer states that pH records render it easy to detect changes in operating conditions, thereby making a more uniform product and eliminating waste. The instrument which provides these records is conventional in appearance but incorporates an advance in circuit design that permits installation of the measuring electrodes at separate and independent sampling points in the plant. They are connected electrically to the recorder which may be a considerable distance away.

Catalogs

• The Brown Instrument Co., Philadelphia, Pa., has just issued a new catalog, No. 8301 — "Industrial Control Devices — Products of Minneapolis-Honeywell Regulator Co." The 56-page, two-color catalog is a comprehensive source of information for increasing production. The first few pages of the book contain a primer of automatic control. The three classes of automatic control (electric, pneumatic and combined electric and pneumatic) are fully described. Forty-four industrial controls and safeguards such as temperature controllers, pressure controllers, humidity controllers, float switches, combustion safeguards, etc., are illustrated. Complete specifications and informative details are given for all types, covering what they are, why they are used, features, capacities, construction and operation. Catalog may be obtained by writing The Brown Instrument Co., Wayne and Roberts Ave., Philadelphia, Pa.

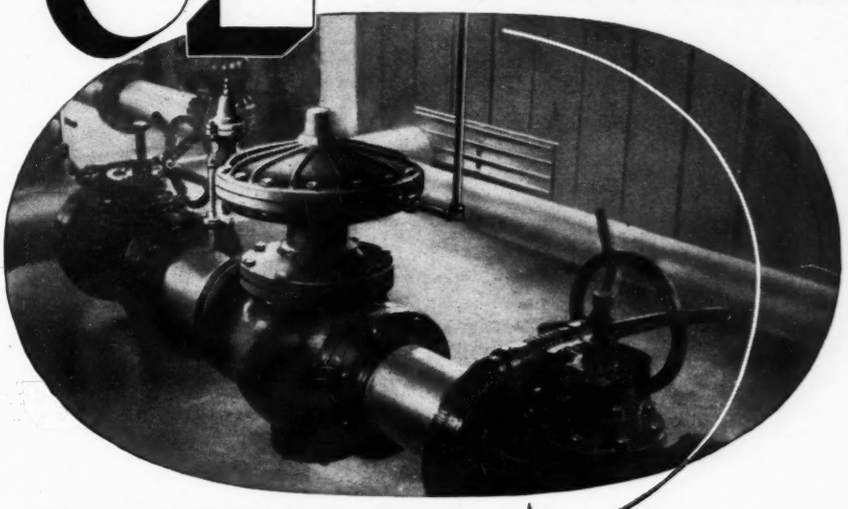
• Wheelco Instruments Co., Harrison and Peoria Sts., Chicago, Ill., has issued a bulletin titled "Priorities and Pyrometers" which is intended to explain to all users of temperature measuring and control instruments how the National Defense Program affects these instruments, their purchase, use, maintenance, and the replacements necessary. The information given points out the present scarcity of various materials and lists other materials which can be used as substitutes. The properties of the original materials and the substitute materials are compared. Recommendations are also given on maintaining present equipment so that it will operate with maximum efficiency and give uninterrupted service.

• Leeds & Northrup Co., 4901 Stenton Ave., Philadelphia, Pa., has issued a 16-page publication titled "Modern Precision" which contains news of that company's instruments, controls, and heat-treating methods, and of the jobs they are doing in industry, in research laboratories, and in teaching and testing. An addition to other Leeds & Northrup Co. literature, it supplements the regular catalogs, bulletins, and circulars which will continue to be issued as before.

• E. D. Bullard Co., 275 Eighth St., San Francisco, Calif., has issued a four-page pamphlet describing the benefits of certain hot weather needs for workers, such as salt tablets, cellulose sponge sweat pads, Venex snake bite treatment, and poison oak and ivy treatments. Title of the folder is "Hot Weather Needs That Aid Working Efficiency."

• The Bristol Co., Waterbury, Conn., has published a folder, Bulletin P1102, describing its newly developed line of Pyrovac Radiation Pyrometers. The folder gives theory of operation and information regarding the use of radiation pyrometers. It is liberally illustrated with engineering drawings showing methods of use.

C-F *
Pilot Loaded
REGULATORS



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Victory Air Conditioning and Refrigerating Committee

Appointment of an executive committee to direct the "Victory Program" of America's refrigeration and air conditioning industry, now devoted to making war products, was announced in New York City by John K. Knighton, director of the program. The immediate objective of the program is to "conserve to the utmost the use of those critical materials required in the production of the implements of war," with emphasis on "saving, simplifying, and substituting."

Among those serving on the committee, which brings together leaders of the refrigeration and air conditioning industry, trade association representatives and an executive of the War Production Board, are: Stuart Lauer, president, York Ice Machinery Corp., York, Pa., and chairman of the board of the Air Conditioning and Refrigeration Machinery Association; P. B. Zimmerman, vice-president, Airtemp Division, Chrysler Corp., Dayton, Ohio; John Wyllie, Temprite Products Corp., Detroit, Mich., and president, Refrigeration Equipment Manufacturers Association; Dr. William R. Hainsworth, vice-president, Servel, Inc., Evansville, Ind., and president of the American Society of Refrigerating Engineers; E. T. Murphy, vice-president, Carrier Corp., Syracuse, N. Y.; and John Jex, Jr., of the War Production Board, Washington, D. C.

■ ■

New Gas Wells Planned

Threatened curtailment of war production and essential civilian activities in Missouri, Kansas and Oklahoma because of lack of sufficient natural gas has been averted through modification of existing conservation laws, announced June 20 by the Director of Industry Operation. Approximately 800 new wells will be allowed.

Supplementary Order M-68-2, issued by the Division, provides that in Missouri and in certain areas of Kansas and Oklahoma, the size of the unit required before drilling, completing, or providing additions to any well can be carried out will be sharply reduced from the original minimum of 640 acres. Necessary material for such work may now be obtained if the unit is 40 acres or more.

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Arkansas Power & Light Co. Rate Reduction Negotiated

Agreement has been reached between the Arkansas State Utilities Commission and the Arkansas Power & Light Co. for reduction of rates charged for natural gas in several communities, counsel for the Commission has announced. Communities affected are: McGhee, Dermott, Lake Village, Eudora, and Wilmot. Savings to consumers ultimately will approximate $12,000 annually, it was estimated. Immediate savings will exceed $4600 a year.

Under the agreement the utility abandons suits seeking to oppose reductions of rates for McGhee, and cut rates for the second and third 1000 ft. from $1.10 to 90¢. There also was agreement that proportionate further reductions shall be made in event the Federal Power Commission grants cuts sought to the Memphis Natural Gas Co. A cut of 9¢ per 1000 ft. is sought for the Memphis distributor. Should this be granted, a balance would be established for the Arkansas consumers, thereby achieving the estimated eventual $12,000 per annum saving.

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Suit to Block Wisconsin Natural Gas Move Filed

A suit asking revocation of a public service commission order authorizing the Wisconsin Southern Gas Co. to distribute natural gas and construct a pipe line from the Illinois state line to Lake Geneva, has been filed by the Wisconsin Coal Bureau and the Milwaukee and Upper Michigan Fuel Dealers' Association.

The complaint alleged the commission overstepped its authority in granting the permit; that its action required approval of the federal power commission; that, even if authority were granted legally, the company could not provide adequate service under the proposed change from manufactured to natural gas, and that Wisconsin labor would be affected adversely.

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Safety Awards Available

A merit award certificate is available to any member gas company of the American Gas Association or division thereof which has completed one million or more consecutive man-hours without a disabling injury accident. Rules and regulations are available upon application by A. G. A. member companies. The award certificates will be presented to presidents of the winning companies at the annual meeting of the Association. Further information may be secured from the Accident Prevention Committee, American Gas Association, 420 Lexington Ave., New York.

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Southern Counties Rates Cut

The Southern Counties Gas Co. has announced a rate reduction amounting to $35.-100 annually for its northern division. The rate reduction has been worked out in conjunction with the California Railroad Commission. The overall reduction amounts to a total saving to customers of 6.2%, effective February 10.

Condensates of Recycled Gas May Be Classed as Crudes

A re-definition placing condensate and recycled gas in the crude oil category is expected to result from the recent hearing held in Austin by the Texas Railroad Commission. Heretofore products of this group have been viewed as recovered by-products from the natural gas field, and they have been held exempt from the restrictions imposed by prorationing. Recently, however, it has been argued that these products are truly crude oils and that they should, therefore, not enjoy this immunity. This contention has been given the nod by Harold L. Ickes, oil coordinator, in a finding specifically designating them as crude oils. The ruling was made to permit the Texas body to impose the prorationing regulations upon them and compel them to bear their share of the burdens resultant from transportation shortages.

The pipe line shortages and the fact that the condensates are in competition with the crude oil products played a large part in the move to have the condensates classed as crude oils.

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Phillips Petroleum Co. Buys Panhandle Eastern Stock

The long battle between the Columbia Gas and Electric Corp., New York, and the Missouri-Kansas Pipe Line Co. was terminated with the announcement Saturday that Columbia's subsidiary, Columbia Oil and Gasoline Corp. would sell its majority holdings in the Panhandle Eastern Pipe Line Co., amounting to 404,326 shares, to the Phillips Petroleum Co., Bartlesville, Okla., for $10,435,654, or $25.81 a share. Upon consummation of the deal, Phillips, one of the country's largest oil and gas producers will sell half of the newly acquired Panhandle stock to the Missouri-Kansas Pipe Line Co., thus augmenting the latter's present holdings of 339,475 common shares. Phillips will receive from Mo-Kan the same price it pays to Columbia.

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Arkansas Court Rules on State Sales Tax on Gas

Gas and electricity produced outside of the State but consumed within the State are nevertheless subject to the State sales tax, according to a ruling by an Arkansas Chancery Court. . Suit was commenced by two industrial corporations on the theory that gas and electricity purchased by them from the Arkansas Louisiana Gas Co. and the Arkansas Power & Light Co., respectively, were transactions in interstate commerce and hence not subject to State taxation.

The State successfully used the "broken package" doctrine to show that gas leaving a trunk line for a distributor's lateral and electricity stepped down in voltage from a high line for local distribution are no longer moving in interstate commerce.

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ASA Issues Standards List

A new list of American Standards will be issued in July, according to a report received from Katherine Snyder, publicity director. The new list will replace that of February 1, 1942. It is also expected that another will be issued in October or November. While there is a nominal charge made for the various individual publications of the Standards, the list itself is distributed free and may be obtained by writing directly to the American Standards Association, 29 West 39th St., New York, N. Y.

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